The CHAIRMAN (Sir N. Bowden-Smith):—As no one seems inclined to make any remarks, I will just say a word or two before we thank the lecturer. I can only say this, that if Mr. Maxim succeeds in carrying out what he proposes—of projecting an aerial torpedo carrying half-a-ton of guncotton to a distance of 9 miles, and which, on striking the water only, would explode and have a destructive area of over 47,000 square feet—he will cause a revolution in naval warfare. The whole of our magnificent fleet, just now collected at Spithead, could be destroyed by a few of these new cruisers at a distance of 9 miles, and that type of cruiser is only to cost £100,000! However, I myself take comfort in the fact that this ship is not yet built, and that these torpedoes are not yet quite ready; and I also take comfort in the thought that when the Whitehead torpedoes first came out, we were told they were going to destroy everything and upset all previous ideas; but it is a singular fact, that up to the present moment, as far as I remember, there is only one case, or certainly not more than two cases, in which a Whitehead torpedo has had any fatal results on a ship. However, it does appear to me, that in these days of high explosives and continual inventions, we really have arrived at the maximum as regards the size of our ships. As regards our battle-ships and cruisers, we ought to endeavour, if possible, to reduce the size. In saying that, I do not mean to cast any reflections on the present Board of Admiralty, and more especially not on our distinguished Chief Constructor, Sir William White, who is, without doubt, the cleverest naval architect in the world; but if Sir William White is told to build a ship which will have to go at a great speed, to have a certain coal endurance, and also to carry other great weights, he has no help for it but to build a ship of a certain size. We must have speed and we must have coal endurance; therefore, if we wish to keep our ships within reasonable limits, it occurs to me that we must dispense with other weights. With regard to the lecture we have just heard, I cannot say, as a naval officer, that I wish the lecturer success; but I think I am only expressing your wishes when I say we are very much obliged to him for coming here and favouring us with this paper. Mr. Maxim, I beg to thank you in the name of the Institution.

THE REPORT OF THE COMMISSIONERS APPOINTED TO CONSIDER THE DEFENCES OF THE UNITED KINGDOM, 1860.

By Vice-Admiral P. H. COLOMB.

THE older I grow the more convinced do I become that the greatest difficulty men have to deal with is that of grasping and appreciating first principles. It is that which hampers Sir Edmund du Cane in his paper on "The Fortification of our Dockyards." in the JOURNAL of the Royal United Service Institution for February, and while allowing him to take exception to certain opinions which have been expressed in regard to the views of the Royal Commission of 1859-60, and their results, it causes him to misinterpret them, and to miss their bearing. He does not perceive that the exception taken to the Report of 1860 is its entire disregard of first principles, and on that account of its inconsequence; and he does not attempt to defend it on the only ground on which it has been attacked.

There is just now quite a reflex action setting in on our defensive policy; so that while most of those who wrote and spoke in the days before the Naval Programme of 1889 and led up to it, devoted themselves to the exposition of the first principles of our defence, and conquered the mind of the country in that way; the bulk of such as now write and speak, carefully avoid considering first principles; put them aside, and tend to throw us back on that sort of chaotic view of defence which will cause Parliament to grant or withhold supplies, not according to the strength of the reasons put forward, but upon the strength of will and persistence of the men who demand them.

The pith of the exception that we must take to the Report of the Royal Commission is that it fully proved the necessity of an increase in the Army, or the Navy, or both, towards which nearly 12 millions would have gone a long way; and then proposed to expend that sum on something which it clearly showed and admitted could be no defence against the sort of attack it apprehended.

But no greater mistake could be made by those who think they can defend the Report of 1860 than to suppose that those who attack it desire to "brand" its members "with incredible wrongheadedness." What those who attack the Report say is, that its members were all full of the false ideas of their day, and that almost any body such as they were, would then have reported in that sort of way. The late Admiral

Sir Cooper Key, one of the members, a man of the highest capacity and intelligence, was then saturated with the views put forward, and it was not till quite late in his life that he began to see things in another light. It was only here and there amongst naval men that the errors of the Report were noticed. Some of the acknowledged leaders of the Naval Service were called as witnesses before the Commission, and gave evidence which then read to us who were in the way of it—myself, for instance—as sound and logical, and it was years before we saw its fallacy. Very few of the witnesses called showed what we now consider a true sense of the position, and Admiral Sir John Hay stands almost alone as a naval officer who holds now exactly the language he held in 1860, in reference to the Report.[1]

We can no more justly apply the term "incredible wrongheadedness" to the building of the works of Portsmouth and Plymouth than we can apply it to the building of the "Hydra," "Hecate," "Glatton," and other coast-defence ironclads, and the large numbers of the "Staunch" class gunboats. Most naval officers see now that it was quite a mistake to have spent our money in this way, but scarcely anyone saw the mistake in the days when the ships were laid down.

The building of the works and the defence ships and vessels were the outcome of a prevalent set of ideas of naval war which had never been corrected by any reference to its history, and the principles deducible therefrom—ideas which, if history is any guide, would have ultimately left us at the feet of a conqueror if we had continued to act on them. I know more than one distinguished and leading naval officer who points with pride to the exact date when in these matters he passed "from darkness to light," and such feel with me that over a large field, wrong ideas are scotched and not killed. By us the report of 1860 is designedly attacked, as the clearest evidence of the fallacies of the day, and because its criticism is the most potent instrument for preventing our falling back into darkness.

Sir Edward Du Cane says that:—"The most outrageous assertions have been made as to the views expressed by the Commission. By selecting passages from their report it has been attempted to show that the fortifications they recommended were intended as a substitute for the superior fleet, which is, of course, a vital necessity for us." Surely if the passages are truly quoted, and not unfairly separated from any context that might modify their signification, it cannot be an "outrageous" proceeding. If the views of the Royal Commission are to be defended on this ground, the only way to do it is to re-quote, and to show that wrong use has been made of quotations. But it is in this passage as much as in any other that Sir Edmund Du Cane is missing first principles. He cannot see that to claim the necessity for the fortification of the dockyards in the presence of a superior British fleet is quite as much a contradiction in terms as to claim that two straight lines can

[1] "Lines from My Log-Books," p. 341. Sir John, in his speech in the House in June 1862, said he had been examined by the Commission, but his evidence is not reported.

enclose a space. This does not seem so to him, and it is because it does not seem so, that he is able to defend—or rather to think he defends—the report of the Royal Commission. He would no doubt make the common answer that he thinks of a superior fleet temporarily inferior. He does not understand that there is and can be no such thing as a superior fleet temporarily inferior. To such as have studied the matter, the attack on any of our dockyards by an enemy which has an inferior fleet to ours is now just as impossible as it seemed to the mind of the great Sir John Jervis and his colleagues in 1789.

But it is time to analyse the Report of the Commissioners, in order to exhibit the danger of upholding it.

The first paragraph professes to show that the fleet alone is insufficient for the defence of the kingdom. This is a practically axiomatic statement if we make it because we admit that the fleet might be beaten. But this is not the line taken by the Commissioners. They said that the command of the Channel was "The first and most obvious line of defence, but it was one that could not, in their opinion, be entirely relied on at the present day, even if England had no greater external interests to protect than the countries which may be opposed to her. Its adoption would involve the necessity of retaining in the Channel for purely defensive purposes a fleet equal to any which could be brought against it, not only by one European State, but by any probable combination of maritime Powers, and this in addition to the other fleets and cruisers which are required for the protection of our vast colonial empire, our military communications with distant dependencies, our extended commerce and interests in every quarter of the globe."

Sir Edmund Du Cane says of the report, of which this is the first paragraph:—"Our supremacy at sea was always treated as a condition which nobody dreamt of dispensing with, though it was seen to be unquestionably possible that it might be locally and temporarily suspended or interrupted." It is evidently impossible to find the idea of supremacy at sea" in this first paragraph, and as it covers the whole Report, we can only reasonably declare that a permanently inferior Navy was the logical basis of the great fortification scheme, just as it was in Charles II.'s time. There is no sign of "temporary suspension" of the superiority of our fleet. We are assumed to have a fleet which might protect our colonial and other interests abroad if we gave up the command of the Channel to our enemies; and it is inferred that if we gave up our interests abroad we might hold the Channel; the paragraph therefore declares as plainly as English can put it, that the condition the Commissioners felt it necessary to provide against was permanent inferiority at sea—permanent loss of command of the Channel in any probable combination against us in war.

The same idea—if yet the language be obscure—is put in the second paragraph:—"Even if it were possible that a fleet sufficient to meet the emergency of a sudden naval combination against this country could be kept available and fully manned in time of peace, such an application of the resources of the nation would lead to an outlay of the public

revenue far exceeding the expenditure which would suffice for that object under other circumstances." This, I take it, must be read as deprecating the expenditure necessary to keep command of the Channel with a fleet, and being prepared to suggest a less expenditure in another way, "which would suffice for that object." If it does not mean, taken in connection with the words of the first paragraph, that "the fortifications they recommended were intended as a substitute for the superior fleet," then I am bound to say that I do not know what it does mean.

It is impossible, at any rate, to misunderstand the plain language of this further passage in the first paragraph:—"England is differently circumstanced from other European States; for were an undue proportion of her fleet to be tied to the Channel for home defence, it must result that theirs would be proportionately set free; to the great danger of our Colonies, and the injury of a commerce which becomes of more vital importance with every successive step of national progress." A supreme Navy must be large enough and numerous enough to overmatch the whole of the Navies opposed to it. Whether the other Navies are scattered or concentrated, does not affect the question. They may be scattered, as in April 1799, when the French had a great fleet at Brest watched by a British fleet; the Spaniards a small fleet at Ferrol, and a large fleet at Cadiz, watched by another British fleet; the French, other ships at Toulon which were matched by the British squadrons at Minorca and Palermo; the Dutch had a fleet in the Texel, watched by another British fleet. Or the French and Spaniards might be concentrated at Ferrol to the number of 90 sail, as they were in August 1799, and yet the British Navy, scattered as it was at first, and concentrated as it was at last, was equally supreme, as neither French, nor Spaniards, nor Dutch, nor all together dared to attack it.

The conditions of 1799 are not those contemplated by the Commissioners. If they thought of historical conditions at all, which there is no proof that they did, they must have supposed a case where, to watch Cadiz and Toulon, we must have let out the ships at Brest, or in the Texel, or both; and if we kept the Dutch and French fleets from taking action in home waters, we must have let Minorca go, if not Gibraltar; and have abandoned the siege of Malta. Whether the Commissioners were aware of it or not, they were supposing a permanently inferior Navy, one much smaller proportionately than we were able to place in 1799 against the fleets of France, Spain, and Holland arrayed against us.

It is necessary to note in passing the curious conceptions that were forced into the minds of the Commissioners by their fundamental acceptance of a fleet which was *not* equal to any probable combination. Thus, in the first paragraph, when they had once accepted a fleet which could not protect our interests abroad, and hold command of the Channel at the same time, they were forced to admit that "our military communications with distant dependencies," and therefore our foreign commerce, could be maintained intact when the enemy was in command of the Channel; or more broadly, in possession of the waters surrounding these

islands. I suppose most people can now see that the thing is impossible, but it is certain that in 1860 it did not seem impossible even to so able a naval officer as the late Sir Cooper Key.

Again, in the second paragraph, we note that the Commissioners considered that the only way to defend this country by the fleet was to keep it fully manned in time of peace. No one now considers such a thing necessary. Everyone recognises our security, provided we keep fully manned a fleet which is at least not inferior to that which probable enemies keep fully manned. It is sufficient that the ships in reserve should have officers and crews in reserve; and those two things are the basis of our present naval policy. It would not now be possible to find a body of naval and military officers to sign jointly a paragraph which would assert the necessity of keeping our whole fleet fully manned in peace-time; or who, supposing this necessity existed, would suggest that anything else "would suffice for that object."

With every respect, therefore, for Sir Edmund Du Cane, I do not think that anyone reading, without prejudice, these first and second paragraphs of the Report, can doubt that what the Commissioners aimed at obtaining was something which might be substituted for a sufficient fleet, and might save the country the expense of providing one. The Navy Estimates then were about 10 millions. Could the Report have been signed by a body of men who supposed that the country was prepared to add to that sum annually, another sum equal to the whole estimated cost of the fortifications?

It is necessary to point out that there is not a word in the Report referring to history or experience in regard to the general case. All the conditions assumed are contrary to experience. The fundamental proposition that the fortifications of ports would save the fleets within them was contradicted by the experience of 1667. The admission that stronger works at Sheerness and Chatham would have kept the "Royal Charles," the "Great James," the "Royal Oak," and the "Loyal London," out of the hands of the Dutch, does not in the least weaken the fact that the Dutch sailed up the Medway and took or burnt them.[1]

Then, the supposition expressed in the first paragraph, that we might forego the retention of a fleet "in the Channel for purely defensive purposes," in order to protect colonial possessions, commerce, and interests abroad, is directly contrary to experience. We let our islands in the West Indies go, we let Minorca go, we let the North American Colonies go, rather than not retain "in the Channel, for purely defensive purposes, a fleet equal to any which could be brought against it."

I think I have shown that there could not have been in the Royal Commissioners' minds any idea of that "supremacy at sea" which we now declare we base our policy upon; and that there was no recognition of any probable condition of war before their minds. I propose now to

[1] The bombardment of Sweaborg is quoted to show that a place may be bombarded without loss to the bombarders. It was forgotten that, as far as the fortification question went, Sweaborg proved that the heaviest fortification would not prevent bombardment.

show, as already mentioned, that the Royal Commissioners proved and admitted the necessity of an increase in the Army or Navy, or both, and in the same breath proposed to divert 12 millions away from Army and Navy to spend on something which by their own showing would not avail against the sort of attack which seemed most likely.

They assumed that steam had greatly facilitated the invasion of this country; and they did not even allude to the facilities which steam might have given to the defence of it, presumably because they supposed that we should not have the material to carry it out with. But under the conditions they set forth, they said:—"The object of the enemy would be, in the first instance, to land a sufficient force on some unprotected part of the coast, to enable him to seize and hold a position under cover of which the invading army might be disembarked. With the power of concentration which steam now affords, such a force might be assembled before daylight upon any point selected for the attempt, and thrown on shore there in two or three hours. Doubtless, the defence would be somewhat aided by railroads and the telegraph; but whilst either real or feigned attempts were made on several positions, troops could not be detached from the threatened localities; and in the event of an attack succeeding in any instance the enemy would secure a position which would serve for the disembarkation of the entire hostile army."

Now, I am bound to say that given no naval defence of these islands, and given also the impossibility of investing them at all, or for a sufficiently long time to bring us to our knees—from the fall in the price of labour and the rise in the price of food—then such a plan as this seems of all others the most likely to be adopted by an enemy, and most likely to succeed. But it is clearly not compatible with any attack upon a dockyard. If the invasion is going to succeed, the dockyards will fall with the rest of the country. The withdrawal of forces, naval or military, or both, to attack a port or dockyard ever so lightly garrisoned and fortified, when the main object is the landing of forces on "unprotected parts of the coast," is a piece of stupidity not conceivable on the side of any enemy.

The Report goes on to point out—still, of course, denying all naval defence—that practically the only defence against an attack of this sort "is the numerical strength of the forces which can be brought into the field to resist the aggressor, the nature and relative state of the two armies being at the same time carefully appreciated." Then we are assured that as things stood, "Even when joined to such portion of the Militia as may be sufficiently trained to act with the Regular Army, the force capable of manœuvring in the field can never be compared, in point of numbers, to the disposable forces of any of the great Continental nations." Paragraph 7 treats of the Volunteers, and suggests that if the movement went on as it had begun, "it might go far to obliterate this numerical disparity." It was doubted, however, whether at the commencement of a struggle, Volunteers could "meet the regularly disciplined soldiers of Continental Armies on anything like equal terms." It was a great question how to utilise the Volunteers.

The conclusion thereupon, in the eighth paragraph, was "That neither our Fleet, our Standing Army, nor our Volunteer Forces, nor even the three combined, can be relied on as sufficient in themselves for the security of the kingdom against foreign invasion."

I own I have always had considerable difficulty in exactly weighing and mastering the meaning of this assertion. It is followed by the sentence:—"We therefore proceed to consider that part of our instructions which directs our attention especially to fortifications," and I have sometimes thought that the Commissioners wrote in a sort of despair; as if they were assured that the country would not make the sacrifices necessary to defend itself either by sea or land; but that, as Lord Palmerston and the authorities were intent on spending money on some sort of fortifications, it was as well to get out a plausible excuse for the expenditure. But I was much shaken in this view by the evidence of many naval officers before the Commission. And when I found that my dear and intimate friend, the late Sir Cooper Key, had, before the Commission sat, written officially pressing the defencelessness of the dockyards against bombardment, and holding that the capture of the Isle of Wight would be aimed at by the enemy as a preliminary to the destruction of Portsmouth Dockyard, it became certain to me that some at least of the Commissioners feared that attacks in that form were our nearest dangers. But then Sir Cooper Key had no doubt as to the ability of a sufficiently powerful Navy to ward off that danger, as well as all other forms of attack. His conviction was that the country would never submit to the necessary expense. When in 1885, as the First Sea Lord of the Admiralty, he joined in raising the Estimates a million and a half, he thought it was as far as we could possibly go. When he died in 1888, the Estimates only stood rather over 13 millions, about half a million more than he had left them; and I suppose he must have thought that nothing short of a miracle would have raised them to their present figure of 22 millions, and maintained them at a higher scale than the Army Estimates.

If then we suppose the military members of the Commission, considering, as they naturally would have done, that the greatest danger was that of invasion; and the naval members, thinking that the most imminent danger was the bombardment of the dockyards; we get the kind of compromise which is expressed in the paragraph quoted. It is not—we may suppose them thinking—possible to get a sufficient Navy, and that will leave the dockyards open to bombardment; it is not possible to get a sufficient Army, and that, because there is an insufficient Navy, will leave us open to successful invasion; let us at least turn to our instructions and secure ourselves, as far as may be by fortifications, against the dangers which our naval colleagues consider nearest.

But it must, all the same, have seemed exceedingly unlikely that if we were open to successful invasion as assumed, the enemy would substitute the bombardment of a dockyard for the larger operation, and it was necessary to make a special case for the fortifications. It was done in this way. In paragraph 10 it was said:—"Should a system of defence by fortification not be adopted, it is evident that if an enemy should

succeed in landing on our shores a larger number of troops than our regular manœuvring army might consist of at the time, he would be enabled to hold that army in check, while he despatched a considerable body of men to attack any of our dockyards. Such a mode of attack is by no means improbable, as the destruction of our dockyards would be one of the most effectual modes of depriving us of the power of refitting our fleet; and by thus enabling the enemy to retain that naval superiority he must have possessed in order to effect the invasion, would at the same time secure his base of operations and his power of obtaining the necessary reinforcements, besides doing much to ensure his ultimate triumph over an essentially maritime State."

Just let us examine this proposition in order to see how extraordinary it is; but note, as a preliminary, the frank admission that our superior fleet would be equally a bar to invasion and bombardment. The Report began, be it remembered, by predicating no fleet, or at least an inferior fleet, in the Channel, because of our Colonial possessions and interests. When the enemy invaded, therefore, he did it because there was no fleet to hinder him. If there was no fleet to hinder him, there was no fleet to refit. Why, therefore, should he commit the astounding mistake of detaching a "considerable body of men" from his main army to make an attack which, by the hypothesis, had no object in it?

Was it supposed that the enemy landed in sufficient force to allow it to be broken up by detachments, before it had beaten the "regular manœuvring army," or made good its footing in any way? Or did the general land with a force only supposed to be sufficient to march upon the capital, but found it all so easy that he was able to seize Portsmouth (say) and London each with separate armies? In neither case could it require "necessary reinforcements." The enemy in either case had troops enough to beat "the regular manœuvring army" and conquer the country, and the only thing which could have suggested failure, and prevented the ultimate capture of Portsmouth, would have been the weakening of the main army in the manner proposed.

But take, on the other hand, a condition which was not predicated by the Commissioners, and does not appear to have been in their minds, namely, a series of battles in the Channel resulting in our fleets being defeated and forced into their ports to "refit." Allow that the enemy's fleets after defeating us are sufficiently powerful to cover and support an invasion, and allow, further, that its success all depends on completing the conquest of the islands before our fleets which have been driven into port are sufficiently refitted to come out again and defeat the enemy's fleets. What then? There are Cork, Milford Haven, Plymouth, Portsmouth, Sheerness, and Chatham, regular naval dockyards. There are also the Mersey, the Clyde, the Tyne, and the Thames, in most of which ports are full appliances for re-fitting warships. Is it intended to be said that the capture of Portsmouth will stop the re-fitting in all the other ports? Or is it meant that the invader will be able to detach forces to capture all of them?

But note the far-fetched notion of the necessity for capturing any

dockyard, or all the dockyards, before they fall in due course into the conqueror's hands. We have established such superiority in the enemy's fleets that they have beaten and driven our own into port. They must keep their superiority as we always did in like cases. How are our fleets to pass the enemy's in order to attack the communications of the invading force? The refitted fleets must fight the enemy's fleets before they can interfere with the invading force, and they must conquer them. What magic lies in "refitting" that should enable the inferior fleets to become the superior, when the whole world is open to the enemy's fleets to strengthen themselves from? We are therefore asked by the Commissioners to agree that the invading general will reasonably weaken his forces in the immediate presence of our defending army, in order to possess himself of one refitting port out of a dozen or two, in order to prevent ships from attacking his communications that are already prevented from doing so by the superiority of the enemy's fleet!—which is absurd.

The Commissioners therefore clearly show us that nothing but a superior fleet can prevent the bombardment of a dockyard. They conclusively show us that if the enemy is in a position to bombard a dockyard, he will not do it, but will invade; and they show us that if the inferiority of our fleets allow him to invade, nothing will prevent him invading but a sufficient defending army. They show us, by the example of Sweaborg, that the heaviest fortifications will not prevent the bombardment of a dockyard. They show us that it is inconceivable to think of a dockyard being attacked on the land side by an invading army. They prove that the only possible defences for this country are a superior Navy, and a great defending Army behind it in case it should be beaten; but they offer absolutely no sound reason for the expenditure of the 12 millions proposed on fortifications.

They had a remarkable witness before them—Lord Overstone the great banker—to whose evidence they directed especial attention in the Report, as if it supported their conclusions. But Lord Overstone said that there was no question relating to the ulterior operations of any invading army *after landing;* the first touch of "our soil by a foreign invader" would, he earnestly declared, bring about immediate collapse in this country; and then if we were not capable of making the sacrifices necessary to prevent that first touch of the invader's foot, we should suffer a deserved fate. Yet the Commissioners had the invaders careering all over the country, and all going well, so long as the inland fortifications of Portsmouth and Plymouth were intact!

Sir Edmund Du Cane again is indignant because those who attack the Report of 1860 warn the public of the danger of locking up troops; yet we have the Commissioners of 1860 telling us that we could not—apart altogether from the enormous garrisons which would become necessary to defend the new works—put in the field a sufficient force to defend ourselves against an invading army, and then claiming to withdraw from the already too small Army, great forces to put away behind walls that might never have an enemy in sight of them!

Sir Edmund Du Cane, as it happens, has to show that in 1860, in the face of dangers of a war with France, it was more politic to spend 12 millions on fortifications than on the Army and Navy. The whole attack on the Report is that it showed it was not more politic, and yet recommended it. The attack is made and continued because what has happened may happen again if it is not guarded against. Public opinion may again be turned from maintaining a superior Navy, with an efficient and powerful Army behind it, to spend its money on something which is neither, and does not add to the power of the nation.

But Sir Edmund has scarcely seen what he had to do. He has elaborately proved, in the bulk of his article, that all through the growing years up to 1860, there was necessity for strengthening the naval and military forces, but he does not attempt to show that the fortifications really strengthened them. Indeed, were we to indulge in the miraculous forecastings of bolts from the blue, it would be easy to show that the land defences of Portsmouth and Plymouth ought to-morrow to be razed to the ground, as positive weaknesses. For suppose a bolt from the blue in this form:—The French secretly embark 15,000 or 20,000 men simultaneously in steamers capable of entering Portsmouth Harbour at low water. They all rendezvous off the Isle of Wight at 3 o'clock some fine morning, and steam straight into Portsmouth Harbour as day breaks. They could not meet with any resistance. They would all be inside the harbour and safe from gun-fire before any one could be sufficiently assured that they were hostile, to fire on them; and then there would be practically no guns manned. The enemy would immediately land; take the garrison by surprise, march into the batteries by their more or less open rear, and in two or three hours be ready to welcome the scores of thousands of men, of tons of stores and provisions, which are always ready when bolts from the blue are to be fired. Provided with a base made more secure, by the chain of inland forts, than the lines of Torres Vedras, our enemy would recruit himself and mature his plans, and then proceed to the orthodox conquest of the realm.

Such a picture is no more a piece of tomfoolery than any of the others to which we are accustomed; but it is made plausible by one thing only, namely, the inland defences of Portsmouth.

Apparently Sir Edmund Du Cane offers one plea, and one plea only, on behalf of the real proposition that it was more politic to spend the 12 millions on the works than on the Army and Navy. He says:—"The 'Warrior,' the new ironclad with 4½ inches of armour, was the strongest ironclad afloat, and no gun then existing could pierce its sides. When I have seen lamentations by those who hold that the money spent on fortifications would have been better applied in increasing the Navy, I cannot help asking whether they have considered what value the expenditure would now have if it had been laid out in additional 'Warriors.'"

This is rather a wonderful piece of argument; for those who disbelieve in the value of the fortifications have only to answer that if the "Warrior" is now considered useless, so are the fortifications. If the

"Warrior" is not absolutely useless, £12,000,000 worth of "Warriors" would even now be of more value than £12,000,000 worth of fortifications. I do not assert that it is reasonable to say either of these things. Only it is the answer an entire disbeliever in the works is entitled to make.

But the argument proposed is futile. The "Glatton," "Hotspur," "Gorgon," "Hecate," "Hydra," and "Cyclops," armour-plated coast-defence ships, are all as efficient as ever they were. But it is—perhaps universally—allowed in the Navy, that these were built under profound misapprehensions of the strategic conditions. They are admittedly useless, not because that class of ship has become obsolete, but because it always was obsolete and can never be called into action. The coast-defence ships can be equally defended on the ground taken up by Sir Edmund on behalf of the fortifications of 1860.

Interest at three per cent. on the 12 millions asked for by the Royal Commission would have supported a force of 7,000 men from that day to this and ever onwards. Is it possible to maintain that a standing force of 7,000 troops would now be pointed to as less valuable than the works and guns which are soulless and dumb without them?

But the whole case of the Commissioners was want of Army and Navy. On their showing, and now on Sir Edmund Du Cane's confirmation, had war come while we were building the forts and neglecting the Army and Navy, we might now be only a third-class Power.

NAVAL NOTES.

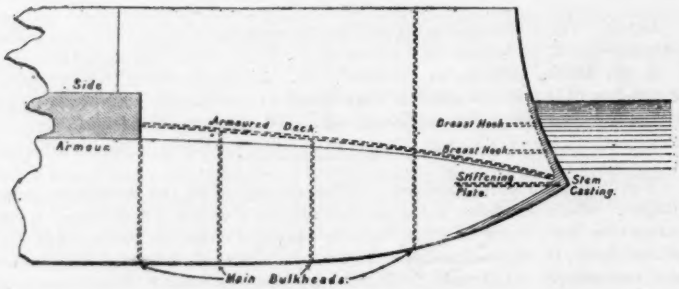
HOME.—The following are the principal appointments which have been made: Captains—G. A. Callaghan to "Hermione"; C. G. Robinson to "Terrible"; E. H. M. Davis, C.M.G., to "Howe"; W. H. Henderson to "Urgent," as Commodore of the second-class at Port Royal—J. H. Rainier to "Nile"; J. S. Halifax to "Thunderer." Commander—E. J. W. Slade to "Algerine."

The "Victorious" has arrived at Hong-Kong, while the first-class cruiser "Edgar," which is to bring home the relieved crew of the "Narcissus," is also detained for the present to strengthen the squadron under the command of Vice-Admiral Sir E. H. Seymour, which is now constituted as follows:—Three first-class battle-ships, "Centurion" (flag-ship), "Barfleur," and "Victorious"; six first-class cruisers, "Grafton" (flag-ship of Rear-Admiral), "Powerful," "Edgar," "Undaunted," "Narcissus," and "Immortalité"; three second-class cruisers, "Pique," "Iphigenia," and "Rainbow"; one third-class cruiser, the "Archer," besides ten sloops, gun-boats, etc., and four torpedo-boat destroyers; the "Rainbow" and "Pique" are to be relieved by the "Bonaventure" and "Hermione," now on their way out, but it is stated that they will not be allowed to leave for home until affairs look more settled. The first-class cruiser "Terrible" has been commissioned at Portsmouth; her destination is as yet uncertain, but for the present she is to carry out a series of trials and will probably remain in English waters, at any rate until after the manœuvres. The second-class cruiser "Bonaventure" has been commissioned to relieve the "Rainbow" in China, and left for her destination on the 19th ult. The second-class cruiser "Hermione" commissioned on the 5th inst. for China, on which station she will take the place of the "Pique." The second-class cruiser "Sybille" arrived on the 15th ult. at Plymouth from the Mediterranean, and paid off at Devonport on the 31st ult. The second-class cruiser "Retribution" arrived at Plymouth on the 11th ult. from the S.E. coast of America, where she has been succeeded as commodore's ship by the "Flora," and was paid off at Devonport on the 29th ult. The second-class cruiser "Sirius" left Plymouth for Malta and the East Indies with relief crew for the "Pigeon," on the East Indian station, on the 10th ult. The third-class cruiser "Philomel" paid off at Devonport from the Cape station on the 1st ult. The third-class cruiser "Rapid" arrived at Plymouth from Australia on the 30th ult.; she is to pay off at Sheerness.

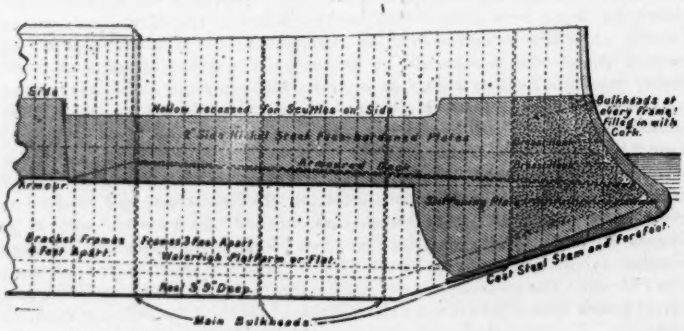
On the 23rd ult. the first-class battle-ship "Goliath," the first keel-plate of which was laid on January 4th, 1897, was launched at Chatham. The "Goliath" is 390 feet long between perpendiculars, has an extreme breadth of 74 feet, and a mean draught of 26 feet, and her displacement will be about 13,000 tons. This draught gives her a freeboard of 22 feet 6 inches forward, 19 feet amidships, and 19 feet aft. The side protection extends for 196 feet of the middle of her length, and from 5 feet below the water line to 9 feet above it, the armour plating being

of Harveyized steel 6 inches thick, while a belt of 2-inch nickel steel armour runs right away in a broad streak along the water-line from the citadel to the stem, and protects a width varying from 12 feet 6 inches to that of the whole depth of the stem below the main deck. This 2-inch or 2½-inch belt, including the skin plating of the ship, represents at least 6 inches of ordinary wrought-iron armour, and will constitute a formidable obstacle to projectiles from small Q.F. guns, and is sufficient to burst common shell from guns of large calibre. The bow

FORWARD PART OF "RESOLUTION."



FORWARD PART OF "GOLIATH" ("CANOPUS" CLASS).



Reproduced from the "Engineer."

THE BOWS OF H.M.S. "RESOLUTION" AND "GOLIATH."

plating of the "Goliath" has, however, a very important duty to fulfil, independent of that of meeting the attack of small quick-firers. A glance at the engraving shows how the cigar-shaped snout of this vessel is stiffened and supported internally by the 2-inch steel-armoured deck, and the elongated stiffening plate below, the breast-hooks lending similar aid near the water-line. In the "Resolution" all these features are also found, but they are only held together by the steel framing

of the ship, and by the ordinary skin of 20-lb. steel plates. The "Goliath," on the other hand, has a double wall of nickel steel supporting the framing, 4 inches in combined thickness, and from 30 feet to 35 feet in depth. This could not possibly be turned aside by impact with the hull of an enemy, but would enter it like a cold chisel, and, after ripping open the plates, its very shape would facilitate the withdrawal of the ram uninjured. The filling in of the 3-foot spaced bulkheads with cork is also an additional safeguard; for it makes the stem a solid but elastic feature right back to the main collision bulkhead. The hollow stems of earlier vessels were always a source of possible danger. Then, again, in the ship now under consideration the double-bottom system is carried forward to the very forefoot itself. The water-tight flat by which this arrangement is effected can be seen in a dotted line above and parallel to the keel; and the longitudinals of the bracket framing are extended by intercostal portions to frames immediately behind the stem casting, thus preventing any working of the structure or of the armour plates covering it. At both ends of the armour-belt rounded armour bulkheads are fitted of the same material, 12 inches, 10 inches, 8 inches, and 6 inches thick. The barbettes at the forward and after ends of the battery are circular in plan, and are armoured with Harveyized steel, the upper tier of plates being 12 inches, and the lower 6 inches thick. The conning towers are circular in form, and both are 9 feet 6 inches thick. From the base of each tower a forged steel communicator tube of 4 inches internal diameter descends, the thickness of the forward one being 8 inches, and of the after one 3 inches, inside of which are led the controlling shafts of the steering engines, engine-room, telegraph rods, and all the important voice tubes. The protective deck between the armoured bulkhead is made of two thicknesses of half-inch steel plates, with additional 1-inch plates on the sloping sides. Beyond the limits of the side armour are a lower deck, protected by two thicknesses of 1-inch plates. The armament of the ship will consist of four breech-loading 12-inch 46-ton guns, on turntables, in circular redoubts, with all-round loading mountings, made by Messrs. Whitworth and Co., and they will be protected by shields, having 8-inch Harveyized steel in front, sides, and rear, the floor plates being of 2-inch nickel steel, and the crown plates of 2-inch mild steel. There are also twelve 6-inch Q.F. guns, eight being in 6-inch casemates on the main deck, while four are similarly protected on the upper deck. The four end main deck casemates have novel features, in that the guns can fire right forward and right aft respectively. Of ten 12-pounders (12 cwt.), six are placed on the upper deck amidships, and four on the main deck fore and aft. Each of the fighting tops of the ship is armed with three 3-pounder Hotchkiss guns, the shelter deck forward with two 12-pounder boat and field guns, and the shelter deck aft, on the boat deck and bridges, with eight Maxim guns and six Howitzer guns. The ship is also fitted with four submerged tubes for 18-inch torpedoes, two on the broadsides forward, and two aft. She will carry fourteen 18-inch and five 14-inch torpedoes, these latter for firing with dropping gear from the ship's steamboats.

The propelling machinery of the "Goliath," which has been constructed by Messrs. Penn and Sons, of Greenwich, are of the vertical inverted expansion type, the cylinders being 30 inches, 49 inches, and 80 inches in diameter respectively, and 4 feet 3 inches stroke. The main and auxiliary condensers in each engine-room are of brass. There are also in the engine-rooms two evaporators and distillers, four fire and bilge engines, four main centrifugal pumps, two hot-well pumps, one drain tank pump, two dynamos, and engines. Three main and three auxiliary feed pumps are in the boiler-rooms. The ship is also fitted with two refrigerating machines, capable of reducing the temperature of a chamber of 1,800 cubic feet capacity to 15° Fahr. after 12 hours' working. Six search-lights are carried, one on the platform high up on each mast, and two on each of the bridges. There are six positions for steering by steam, viz.,

forebridge, both conning towers, tower deck forward, and in both steering compartments. There are twin screws, 17 feet in diameter, and arranged so that the pitch can be varied. The I.H.P. of the engines is to be 13,500; speed of ship, 18½ knots. The ship carries 16 boats.

The total cost of the launch was about £2,000, the preparations having necessarily been of a most extensive and elaborate character. The cradle in which the "Goliath" was launched in itself weighed about 300 tons. The sliding ways supporting it and the vessel were 306 feet long, and the ground ways, or those supporting the whole superincumbent weight—ship and cradel, etc., or over 6,300 tons—were 425 feet long, and in launching the pressure upon every square foot of bearing surface exceeded three tons. For the information of those who are curious about details, it may be added that five tons of Russian tallow and over a ton of train oil and soft soap was used in greasing the ways. The name "Goliath" has been borne by several Navy vessels. In 1797 a 74-gun ship, commanded by Sir Charles H. Knowles, took part in Jervis's battle of St. Vincent. The same ship was engaged in the bombardment of Cadiz, and in 1798 she was present at the battle of the Nile. The "Goliath" led the van, and engaged the 74-gun ships "Guerrier" and "Conquérant," doing much damage to these vessels, but also suffering severely herself. In 1803 she captured a French corvette, and in 1813, during the American war, she was cut down to a 58-gun vessel. In 1820 the 84-gun ship "Goliath" was built, and in 1842 another ship of 80 guns bore the same name.

The Admiralty have contracted with the Clydebank Shipbuilding Company, Glasgow; Messrs. Scott and Co., Greenock; the Fairfield Company, Govan; and Messrs. Vickers, Sons, and Maxim, Barrow, for the construction of the four first-class cruisers of the "Cressy" type. They are the first armoured cruisers to be built since the "Australia" class was ordered ten years ago, and they will constitute an entirely new type. In many respects they will resemble the "Powerful" and the "Diadem" classes, embodying the best features of each, with the addition of an armour-belt of considerable area. In dimensions they will be more like the "Diadem," as they are to be 440 feet long between perpendiculars, 69 feet 6 inches in beam, as compared with 500 feet by 71 feet in the case of the "Powerful," and 435 feet and 69 feet in the case of the "Diadem." The draught will be 26 feet 3 inches, and the displacement 12,000 tons. The difference in displacement between the new cruisers and the "Diadem" is due to the extra armour carried. The total will amount to 1,200 tons. The "Diadem" has all her guns as effectively protected with nickel steel as the "Cressy" class, and as the hull of the "Cressy" class will weigh 7,860 tons, or 885 tons more than that of the "Diadem," the additional weight may be regarded as entirely due to the armour. The broadside armour will consist of a belt 11 feet 6 inches deep, extending 5 feet below the water-line and 6 feet 6 inches above it. This armour, which is to be 6 inches thick, will extend for a length of 230 feet, terminating 120 feet from the bow and 90 feet from the stern, in thwartship bulkheads 5 inches thick. The hulls are to be teak sheathed and coppered. The main armament will resemble that of the "Powerful" rather than that of the "Diadem." The latter has two 6-inch Q.F. guns on the forecastle, with shields, and two of the same calibre on the upper deck, firing aft like those of the "Powerful." The "Cressy" class will have instead a 9·2-inch 22-ton gun firing ahead and one firing astern, but the weapons will be mounted in barbettes with 6-inch armour, the guns, as formerly, being protected by shields. The 9·2-inch guns fire a 380-lb. projectile, with a muzzle energy of 14,520 foot-tons, so that the "Cressy" cruisers will do effective duty when chasing an enemy or fighting in the line, for both guns have a large arc for broadside attack. Four 6-inch Q.F. guns are to be arranged in casemates to fire ahead in line with the

keel, and four to fire astern, and these also can fire on the broadside at almost any angle. There are also to be four guns amidships on the main deck, two on either side. There are in addition to be distributed throughout the ship twelve 12-pounders and a large number of machine guns. Each of the types of ships mentioned—"Cressy," "Powerful," and "Diadem"—will fire 4,500 lbs. of shot per minute at a retreating enemy or a pursuing ship, but the two former ships have the advantage which the one 22-ton gun gives in penetration over two 7-ton guns. In the arrangement of boilers again the "Cressy" cruisers resemble the "Diadem" rather than the "Powerful." In the "Cressy" class the four boiler compartments will take up 130 feet of the length of the ship as against 132 feet in the "Diadem" and 186 feet in the "Powerful," but there is not much difference in the size of the engine-rooms. The coal bunkers are to be arranged on either side of the boiler-rooms under and over the protective deck, and, as in all ships now built, an ammunition passage is to be arranged immediately under the protective deck. There is to be a thwartship bunker right forward. There will be 30 boilers of the Belleville type fitted with economisers, as in all later ships, an arrangement which gives great economy in the "Diadem." In the forward boiler-room there will be six generators, and the three other boiler-rooms will have eight apiece. The boilers have been designed with the same liberal steam-generating surfaces as in the "Diadem" class, so that no difficulty will be experienced in obtaining the full power—and even a little more, should it be of any utility—and at the same time a higher power will be obtained per ton of machinery than could have been realised with the ordinary boilers. The working pressure will be 300 lbs. per square inch, reduced to 250 lbs. at the engines. The latter have been arranged to give 21,000-I.H.P., and the cylinders will be of the following diameters:—One high pressure of 36 inches, an intermediate of 59 inches, and two low pressure each of 68 inches, while the stroke will be 48 inches. At full power the engines will make 120 revolutions, so that, except that they are a little larger, they resemble closely those of the "Diadem" and "Ariadne" classes, which were designed to develop 18,000-I.H.P. The speed of the new cruisers is to be 21 knots, which should easily be realised. The vessels will have four funnels and two masts, with a top on each for carrying search-lights (but no guns), and with the usual semaphores. There will be the same arrangement of decks in all three classes. It seems a pity, however, that in the design for these ships, arrangement could not have been made for running a nickel-steel 2-inch belt at the water-line from the citadel to the stem, as has been done in the "Canopus" class of battle-ship. All the French armoured cruisers have practically an all-round water-line belt of hardened steel.

The keel-plate of the new battle-ship "Formidable" was laid on the 21st ult. at No. 5 Slip, Portsmouth Dockyard. For some weeks previous the preparatory work had been in hand, and rapid progress is consequently being made with her. Hitherto it has been customary to build up the keel on the blocks on which the vessel is constructed, but in this case the whole of the keel was put together and then hauled over to the blocks which formerly constituted the beginning of the ship. The "Formidable," which is the first of her class, is to be 400 feet in length, 75 feet in beam, and will have a mean draught of 26 feet 9 inches, having thus 10 feet greater length and 9 inches less draught than ships of the "Majestic" class. She will have a sloping bow, similar to that of the "Canopus," but a peculiarity in the "Formidable's" design is that her bottom is to be cut away just behind the propeller blades. This is in order that the ship may be turned with greater facility. The armour is to be distributed in the same way as that of the "Majestic." She will have a displacement of 15,000 tons, a speed of 18 knots, and will be armed similarly to the "Majestic" class. She is to be rapidly advanced during the ensuing financial year, when more than £400,000 will be expended on her.

The engineering of the three battle-ships of the "Formidable" class next in building has been undertaken by Earle's Shipbuilding Company, Hull; the Fairfield Company, Govan; and Messrs. Maudslay, Sons, and Field, London. The engines will be of the triple-expansion type with three cylinders. The cylinders will be 31½ inches in the case of the high pressure, 51½ inches in the intermediate, and 84 inches in the case of the low pressure, and in each the stroke will be 51 inches. There will be the usual two sets, each driving their separate screws, and the collective power will be 15,000-I.H.P., with the engines making 108 revolutions, which is equal to a piston speed of 918 feet per minute, the same as in the "Canopus" class where, however, the power is 13,500-I.H.P. Steam is to be supplied from 20 Belleville boilers with economisers which are designed with 37,000 square feet of heating surface and 1,168 square feet of grate area. This gives rather less than 2½ square feet of heating surface per I.H.P., while 13-I.H.P. is expected per square foot of grate area. The speed realised on trial with 15,000-I.H.P. is expected to be about 18 knots.

The new first-class battle-ship "Illustrious" has now concluded her steam trials satisfactorily. The results of her eight hours' natural-draught trial were as follows:—Draught of water—forward, 25 feet 11 inches; aft, 26 feet 6 inches; speed of ship, 15·96 knots; steam pressure in boilers, 147 lbs. per square inch; vacuum in condensers, 26·4 inches starboard, 28·0 inches port; revolutions per minute, 96·7 starboard, 96·2 port. Mean pressure in receivers—starboard, high, 144 lbs.; intermediate, 56 lbs.; low, 13 lbs.; port, high, 144 lbs.; intermediate, 59 lbs.; low, 13 lbs. Mean pressure in cylinders—starboard, high, 53·3 lbs.; intermediate, 25·5 lbs.; F. low, 12 lbs.; port, high, 44·8 lbs.; intermediate, 25·4 lbs.; F. low, 12·6 lbs. Mean I.H.P., starboard, high, 1,667; intermediate, 1,740; F. low, 1,819—total, 5,226; port, high, 1,394; intermediate, 1,722; F. low, 1899—total, 5,015; grand total for the two sets, 10,241. During her four hours' full-power trial in the North Sea, the battle-ship encountered very boisterous weather, and her speed was considerably affected thereby. The official details are as follows:—Draught of water forward, 25 feet 5 inches; aft, 26 feet 6 inches; speed of ship, 16·5 knots; steam pressure in boilers, 152 lbs. per square inch; vacuum in uptakes, 1·96 inches; vacuum in condensers, 27·0 starboard, 27·4 port; revolutions per minute, 99·4 starboard, 99·6 port; mean I.H.P., 6,021 starboard, 6,091 port—total, 12,112; mean revolution of fans—induced draught, 320; ventilating fans, 300. The induced-draught mechanism worked efficiently. The H.P. stipulated for by the Admiralty in their contract was 12,000 and the speed under induced draught 17½ knots.

The new torpedo-boat destroyer "Violet" has completed her second stipulated three hours' 30-knot trial at Portsmouth successfully; the vessel encountered a beam wind, but on the whole the weather was favourable; the mean of the six runs on the measured mile showed that with 381 revolutions and 6,600 I.H.P. the vessel had a speed of 30·014 knots; the highest speed attained during three hours was 30·8 knots, and the mean of the entire run was 30·16 knots, which was obtained with 381·2 revolutions and 6·630 I.H.P. The new torpedo-boat destroyer "Flying Fish" had her final steam trial at Portsmouth, recently when, with 6,454-I.H.P. and 392·5 revolutions, she obtained a mean speed on a three hours' run of 30·371 knots; the mean of six runs on the mile was a speed of 30·172 knots, with 390·7 revolutions; after the speed trial the vessel tried her steering machinery ahead and astern, both steam and hand gear being tested, and afterwards she had her starting and stopping trials, all of which were satisfactory. The new torpedo-boat destroyer "Wolf," built by Messrs. Laird Brothers, of Birkenhead, has completed her official full-speed trial with satisfactory results on the Clyde; the speed obtained on six runs over

the measured mile was 31·2 knots, and the speed for the three hours' continuous steaming 30·3 knots.

An official trial of a specially prepared projectile was successfully carried out at Messrs. Vickers, Sons, and Maxim's range at Swanley, recently, in the presence of representatives of the Admiralty and War Office. The trial was of considerable interest, as it is well known that after a gun has fired many hundreds of rounds the velocities fall off to some extent, due to erosion and other causes. The point of difference whereby this projectile differed from others was that an arrangement was screwed on to the base of the shell by which a specially prepared ring was made to expand in the eroded portion of the bore so as to overcome the injurious effect of erosion, caused by smokeless powders, as well as to prevent the shot being over-rammed, should the bore be worn by this or other causes. The general principle of the gas check depends upon the compression of this specially constructed ring by an annular copper ring, which conveys pressure to the specially constructed ring in such a manner that the specially constructed ring makes a perfect metallic seal, against the bore, and completely prevents any gas at a high temperature and pressure passing the base of the shot, and hence does away with the principal cause of erosion in guns. Four rounds were fired with this specially banded shot, and four with the ordinary service shot, and it was found that the whole of the energy of the gun was restored after upwards of 250 rounds had been previously fired. The actual ballistics obtained were 2,694 feet per second for a pressure of 13 tons with a 25-lb. charge of cordite. By increasing the charge by a moderate amount, and slightly increasing the initial chamber pressure, a velocity of 2,900 feet per second could reasonably be expected. It is claimed that this simple application is capable of being applied to almost any design of shell at a very moderate cost, and by its application it is confidently expected that guns after firing many hundreds of rounds will be equally efficient, as far as energy is concerned, to a new gun.—*Naval and Military Record, Engineer,* and *Times.*

Précis of the Report of the Director-General of the Medical Department of the Navy for 1896.—The returns of 1896 for the total force serving afloat may be regarded altogether as the most satisfactory that have been furnished by these reports since they were first published in their present form in the year 1856, the aggregate number of cases of disease and injury rendered for the year showing only a ratio of 911·07 per 1,000 of the mean force, the lowest recorded during the past forty years. When compared with the previous year it not only shows a decrease in the total force, but also on all stations excepting that on the Home. Contrasted with the average ratios for nine years there is a reduction both in the total force and on all stations; the Home and South-East Coast of America stations alone excepted.

The death-rate of the total force, viz., 5·28, is also a decrease on that of the previous year, and is the lowest obtained since 1856. The invaliding rate, however, shows a slight increase of 2·1 per 1,000 over that of 1895, and of ·91, when compared with the average ratio for the last nine years. There has been, when constrasted with last year, a great decrease in the ratio per 1,000 of cases, amounting to 632·37, on the Cape of Good Hope and West Coast of Africa station. This is largely due to a reduction in the number of cases of malarial fevers, which, owing to a considerable amount of river work in 1895, was very high in that year. Three cases of plague are returned as occurring in the persons of natives, viz., one from the East India station, and two from the China station; they all proved fatal. The ratio per 1,000 of cases of primary and constitutional syphilis shows a slight increase when compared with 1895. Contrasted with the ratios of the last nine years, there is an increase in the latter, but a decrease in the former of 5·92 per 1,000, and a slight decrease is also apparent in those of gonorrhœa and its sequelæ.

The total force in the service afloat, corrected for time, in the year 1896, was 72,620 officers and men, of whom 44,010, or 60·6 per cent., were between the ages of fifteen and twenty-five; 20,610, or 28·38 per cent., were between the ages of twenty-five and thirty-five; 6,940, or 9·55 per cent., were between the ages of thirty-five and forty-five; and 1,060, or 1·45 per cent., were above forty-five years of age.

The total number of cases of disease and injury entered on the sick-list was 66,162, which is in the ratio of 911·07 per 1,000, being a decrease, compared with the previous year, of 48·25 per 1,000, and of 61·17 per 1,000 when compared with the average ratio of the last nine years. The average number of men sick daily was 2,838·14, which is in the ratio of 39·08 per 1,000, and shows a decrease, compared with the previous twelve months, amounting to 1·96 per 1,000, and of 2·55 per 1,000 in comparison with the average of the last nine years. The number of days' sickness, on board ship and in hospital, in the total force was 1,038,760, which gives an average loss of service from disease and injury of 14·3 days for each person, and shows a decrease, compared with the preceding year, to the extent of ·68 day, and a decrease of ·9 day in comparison with the average of the last nine years.

The total number of persons invalided was 1,987, which is in the ratio of 27·36 per 1,000, and shows an increase of 2·1 per 1,000 compared with the previous year, and of ·91 per 1,000 contrasted with the average of the last nine years. Out of the total number of persons invalided 1,847 were invalided for disease, and 140 for injury. The ratio of invaliding for disease alone was 25·43 per 1,000, and for injury 1·92 per 1,000. Compared with the preceding year, there has been an increase in the invaliding rate on the Home, Mediterranean, North American and West Indian, South-East Coast of America, Pacific, and China stations, and in the irregular force, but a decrease on the other stations. Out of the above total 1,299 persons were finally invalided from the Service, being in the ratio of 17·88 per 1,000 for the whole force, or 65·37 per cent. of the number invalided, showing an increase of 1·49 per 1,000 compared with 1895.[1]

The number of deaths was 384, which gives a ratio of 5·28 per 1,000, and exhibits a decrease of 1·32 per 1,000 in comparison with 1895, and of 1·75 on the average of the last nine years; of this number 277 were due to disease, and 107 to injury. The death-rate from disease alone was 3·81 per 1,000, and from injury 1·47 per 1,000.

The average number of entries on the sick-list for disease and injury per man on the Home station was ·83; on the Mediterranean station, ·91; on the North American and West Indian station, ·9; on the South East Coast of America station, 1·05; on the Pacific station, ·94; on the Cape of Good Hope and West Coast of Africa station, ·93; on the East Indies station, 1·34; on the China station, ·98; on the Australian station, 1·05; and in the irregular force, 1·12. The average number of cases per man in the total force was ·91, being ·04 lower than in 1895.

The lowest sick-rate was on the South-East Coast of America station, and the highest on the Home station. The ratio per 1,000 of men sick daily on the Home station was 41·85; Mediterranean, 32·11; North American and West Indian, 36·98; South-East Coast of America, 31·78; Pacific, 35·13; Cape of Good Hope and West Coast of Africa, 35·94; East Indies, 41·3; China, 41·09 Australian, 35·5; and in the irregular force, 38·86. The average ratio of

[1] The first total includes men temporarily invalided from foreign stations, many of whom on arrival in England, or after treatment in home hospitals, were again able to join the active force. The number finally invalided represents the waste of the Service from this cause during the year.

sickness for the total force was 39·08 per 1,000, which is a decrease of 1·96, when compared with the preceding year.

Compared with 1895, there was an increase in the death-rate on the North American and West Indian and Pacific stations, and in the irregular force, but a diminution on the other stations.

High Explosives and Modern War-Vessels.—The following article has been taken from the *Engineer*, and may be of interest to those who have no opportunity of seeing that paper.

"The old battle-ship "Resistance" has at last come to the end of her somewhat chequered career, and her 4-inch iron plates have recently been stripped off for service as targets on the excellent ground at Whale Island. She has been riddled with ordinary projectiles of every calibre, torn to pieces between decks by high-explosive shells, and sunk by torpedoes on more than one occasion, having been subsequently raised for further experimental practice upon her hull. A vast number of points has been conclusively settled during the course of the experiments which have been made with her. The futility of ordinary light armour as a preventive to the penetration of the smallest armour-piercing projectiles even when protected by a backing of several feet of teak or oak timber, has been plainly shown. The great destruction which would be effected upon the upper decks by the smashing of the superstructure and boats thereon in action, has also been illustrated by experiments with dummies; whilst the value of a thick stratum of coal in bunkers along the ship's side has been thoroughly tested; and, lastly, the awful havoc which would be wrought between decks by the bursting of shells filled with high explosives, has been exhibited with appalling distinctness.

The first of these important lessons has resulted in the substitution of carburised armour plates for ordinary steel shields to protect all the heavy and medium gun positions in recent war-vessels; the second, in the covering over of the upper deck battery at the sides with plating for some distance, and the stretching across the open space thus left between of a stout steel wire netting to catch splinters; and the third, in greatly multiplying the number and increasing the size of the coal bunkers along the ship's sides, from the main deck down to the bilge. The fourth lesson, however, remains only as a terrible, incontrovertible fact, which cannot apparently be got over. It is to this fact that we allude now.

We would invite an inspection of the hull and between decks of the "Resistance," in order to emphasise the remarks which we are about to make. No very heavy gun has been employed in negotiating the destruction of the helpless hulk; but 9·2-inch projectiles have passed through her from side to side, just as though she was so much putty, and even 6-inch armour-piercing shot have traversed her from stem to stern; the wrought-iron armour plates being torn off, and the skin of the ship's sides and bulkheads being swept away as though they consisted of brown paper. Then the between decks is a sight never to be forgotten—framing, splinter screens, partitions, and bulkheads have been rent into fragments by the bursting of the high-explosive shells, whilst grim splashes of a yellow substance that has marked the places where shells have burst outside the plating betoken the character of the explosive employed.

It is now an acknowledged axiom that high explosives will be employed in shells. Whether naval officers object to carry them on board ship or not, they will in future be the principal ingredient by which shells are filled for coast and siege purposes; and already the nature of high explosive to be used as a "service" bursting charge for high-angle howitzers in coast and siege batteries has been practically determined.

After exhaustive trials, all inventions in this direction, except wet guncotton and lyddite, have been discarded. A satisfactory high explosive has been

defined as fulfilling the following conditions :—"It should be safe in manufacture store, and transport, and stable under service conditions. It should be of a convenient form for filling shell, and safe to manipulate in the process. It must be capable of standing the shock of discharge in high-velocity guns, and must, on striking, detonate with violence and certainty, and without the aid of any dangerous fulminate. The explosive should be capable of having its sensitiveness increased or diminished as occasion may require, and a shell, when filled with it, should not detonate when hit by another shell." "Of those high explosives experimented with, the two coming nearest to the standard are wet guncotton, which has been adopted by at least one European Power, and lyddite, which is used in our Service." Wet guncotton will not detonate in a shell struck by another shell, and in this respect is more satisfactory than lyddite ; but guncotton, to produce its best effect, must be compressed into discs to fit the interior of the shell, and the shell must therefore be made in two parts and screwed together—a source of weakness and possible danger. Dry cotton and a fulminate are, moreover, required to detonate it. Hence lyddite, to which none of these objections apply, will probably be adopted as the high explosive of our Service.

Such being the case, it is interesting to note the character and appearance of lyddite. Under the name of picric acid it has long been known. Picric acid is a nitro-substitution compound obtained by the action of nitric acid on a variety of substances ; for example, indigo, silk, acaroïd resin, etc., but on the commercial scale the substance now generally acted on by the nitric acid is carbolic acid, and the equation of the process is simple, viz. :—

Carbolic acid. *Picric acid.*

$$C_6 H_6 O + 3 H N O_3 = H . C_6 H_2 . 3 N O_2 . O + 3 H_2 O .$$

Picric acid may, as written above, be regarded as a picrate of hydrogen, which latter element can be displaced by a metal to form an ordinary picrate—for instance, picrate of potassium, $K . C_6 H_2 . 3 N O_2 . O$. It is a crystalline substance of a brilliant yellow colour, and is intensely bitter to the taste. It burns with a very smoky flame. It is largely used as a dye, or constituent of dyes, and has not been usually considered as an explosive. Nor, indeed, does it usually behave like an explosive under ordinary circumstances, though under special conditions easily produced, it is capable of developing its now well-known formidable explosive properties. It may be burnt away in an unconfined state in considerable quantity without explosion, but the mere contact of certain metallic salts or oxides with picric acid in the presence of heat develops powerful explosives which are capable of acting as detonators to an indefinite amount of the acid, wet or dry, which is within reach of their detonative influence.

Lyddite has proved to be a fairly stable compound, and safe in manufacture, store, and transport. High temperatures abroad, or in ships' magazines, do not affect its condition. When carefully packed into shells it does not "set back" like the nitro-glycerine in dynamite, on the shock of discharge, and so interfere with the "exploder," or create a condition of extreme danger, from the likelihood of a premature. Several accidents have occurred during the firing of shells charged with lyddite, from this last-mentioned cause, viz., the projectile prematurely exploding in the bore of the gun. But in the majority of cases the causes of the disaster were traced to faults in the shell, and were not due to oversensitiveness of the lyddite. Shells to contain it are now made of the best forged steel, which minimises the prospect of prematures. The action of a powder fuse will not detonate lyddite, hence an exploder containing a few ounces of a safe and stable explosive is employed. It is inserted in a hole drilled centrally in the charge. The actual nature of the exploder used by the War Department is kept secret, but many metallic oxides and nitrates will detonate when brought into contact with picric acid at a high temperature, and this fact has probably been taken advantage of by the chemical department.

Clearly, then, the high-explosive shell has a very marked future before it, for artillery fire or active service; and, as foreign Governments have gone even further than we have in the development of this terribly effective projectile—for one European Navy, at least, has already introduced the mélinite shell into its magazines on board ship—we must be prepared for attack with high-explosive shells in the next naval action, not only from shore batteries, but from the enemy's vessels.

This is a serious outlook. Take the cases of the "Majestic," "Powerful," or "Diadem" types. Probably the 6-inch Harveyized steel armour plates upon the 6-inch gun casemates of these vessels would break up or explode outside the majority of high-explosive shells with which they might be attacked, and the side and barbette armour would certainly be sufficient to effect this desirable end; but the whole of the upper deck battery would be at the mercy of a few high-explosive shells which should burst within it, either from contact with a 12-pounder mounting or any other cause, and the whole of the main deck space from stem to stern, except the eight closed-in casemates, including the entire series of officers' cabins, would be mere shambles in a quarter of an hour. If anyone doubts the probability of this, let him go over the "Resistance" and judge for himself. She is an object-lesson, the value of which cannot be controverted.

But, it may be asked, is there any remedy for such a condition of terrible insecurity as regards the officers and crews of our war-vessels in the future should the high-explosive shell do all that is expected of it? We believe that there is a partial remedy, but we fear not one that will commend itself in the eyes of our naval constructors. Looking at the "Powerful" or "Diadem," the enormous freeboard given to these types cannot but excite observation. Is it excessive or not? That is the question. We cannot help thinking that, in running away from the evils of low freeboard, we have now run into the opposite extreme, if only the casemates can be adequately protected with armour against high-explosive shells, whilst vessels of so high a degree of freeboard are being built. We would cut them down in future and utilise the saving in weight of material thus released to provide a more extensive system of armour protection over the reduced surface of the ship's sides. As the "Powerful" and "Diadem" types are at present they are merely huge targets, which will be the sport and pastime of an energetic enemy who may possess guns firing high-explosive shells; their only chance in action would be to at once crush their enemy with their own high explosives, or run away and trust to the diminishing perspective of their form as they disappear over the horizon for the chance of not being hit. As regards our battle-ships, it is difficult to suggest anything; but surely a *milieu* could be designed between the "Nile" and "Trafalgar," which possess almost perfect immunity from the chance of destruction between decks by high-explosive shells, and the "Majestic," which has none whatever above the main deck. Here is food for reflection."—*Engineer.*

FRANCE.—The following are the principal promotions and appointments which have been made: Vice-Admirals—L. H. Brown de Colstoun to be President of the Committee of the Inspector-Generals of the Navy; Em. Parrayon to be an Inspector-General of the Navy. Rear-Admirals—C. De la Bonninière de Beaumont to be Vice-Admiral; C. F. E. De Courthille to be Chief of the Hydrographical Department. Capitaines de Vaisseau—P. A. Servan and L. Valéry to be Rear-Admirals; J. J. Bugard to "Dupuy de Lôme"; P. M. E. Drouillard to "D'Assas." Capitaines de Frégate—V. Y. Imhoff and A. A. Hallez to be Capitaines de Vaisseau; L. A. Sellier to Command of the Local Flotilla of Annam and Tonquin; V. J. Richard to command of *Défense Mobile* at Cherbourg; L. H. Dufaure de Lajarte to "Épervier"; C. P. Rihouet to "Calédonien"; E. F. L. Le Prieur to "Wattignies"; J. G. Revertégat to "Milan"; J. M. F. Lallemand

to "Léger"; L. J. M. Lormier to Command of *Défense Mobile* of Algeria; P. Moritz to Command of *Défense Mobile* at Rochefort; A. M. Pichon to "Fabert." —*Le Journal Officiel.*

The new second-class cruiser "D'Assas," on completion of her trials at Brest, will be commissioned for active service, proceeding to the Mediterranean, where she will relieve the first-class armoured cruiser "Latouche-Tréville" in the Active Division of the Mediterranean Fleet, which ship will be placed in the 2nd Category of the Reserve, part of the crew being turned over to complete the "D'Assas'" complement; on a coal consumption trial the ship with 14 boilers alight out of 20, and the engines developing 3,500-I.H.P., maintained a mean speed of about 16 knots, the coal consumption per H.P. per hour being only 0·69 kilogramme; at her six hours' full-speed trial under natural draught the engines developed close on 8,000-I.H.P., giving a mean speed of 18·7 knots with a coal consumption of 0·823 kilogramme per H.P. per hour; during a 24 hours' run at 6,000-I.H.P., the mean speed was over 17·5 knots. The new second-class cruiser "Catinat" at Cherbourg has been continuing her trials; with the engines developing 3,900-I.H.P. a mean speed of 15·7 was maintained with a consumption of coal per H.P. per hour of 613 grammes. The new third-class cruiser "Lavoisier" has lately made a satisfactory full-speed trial under forced draught; with the engines developing 7,450-I.H.P. (1,050-H.P. more than the contract) the ship maintained a mean speed of 21·5 knots for three hours, a knot and a half in excess of the contract speed. The new first-class battle-ship "Bouvet," which was to have proceeded to Brest from Lorient for her trials, is now ordered to Toulon instead, and her trials will be carried out at the latter port; after her trials she is to join the Active Squadron of the Mediterranean Fleet. The official trials of the new first-class battle-ship "Masséna" at Brest, have not yet been successful; it is said that her screws are not sufficiently immersed, while it is moreover rumoured that her stability is not quite what it should be.

The cruiser "Jean Bart," recently despatched to the China station, arrived at Saigon on 5th February. Three blades of one of her propellers were damaged passing through the Suez Canal. The necessary repairs will be made at Saigon.

In place of passing into the 2nd Category of the Reserve, as was originally intended after for a short time taking the place of the "Redoutable" in the Reserve Squadron, the second-class battle-ship "Courbet" has temporarily relieved the "Dévastation" in the same squadron, the latter ship being placed in the 2nd Category at Toulon for repairs. The first-class armoured cruiser "Chanzy," having been relieved in the Active Squadron of the Mediterranean Fleet by the new second-class cruiser "Du Chayla," has taken the place in the Reserve Division of the coast-defence battle-ship "Indomptable," which is to be paid off into the 2nd Category at Toulon. The Reserve Division will therefore for the present consist of only three armoured ships, viz., the two second-class battle-ships "Amiral Duperré" (flag) and "Courbet," and the "Chanzy."

The dimensions of the new first-class armoured cruiser "Amiral de Gueydon," which has lately been commenced at Lorient, are as follows:—Length, 448 feet 6 inches; beam, 63 feet, with a displacement of 9,515 tons. She will be driven by three screws, and the engines are to develop 20,000-I.H.P., giving a speed of 21 knots. Her Niclausse boilers will be placed before and abaft the engines, the latter being constructed at the works of Chantiers de la Loire at St. Denis. There will be a water-line belt of hardened steel 6 inches thick, extending from the stem to near the stern, which will be closed by a transverse 3-inch armoured bulkhead; above the 6-inch belt will be a second narrower belt of 3·9-inch steel protecting the cofferdam; there will also be two armoured decks. The armament will consist of two 19·4-centimetre (7·6-inch) guns, of 93–96 model, in turrets, one forward and one aft, with an arc of fire of 270°; eight 16-centimetre (6·3-inch) Q.F. guns of the same model in armoured casemates, so arranged that four can fire ahead and four astern.

The *Journal Officiel*, of 16th March, publishes the following decree affecting capitaines de frégate and lieutenants de vaisseau of 14 years' seniority :—Second-class cruisers, not having special missions, will be in future commanded by capitaines de frégate, with, as second in command, either a junior capitaine de frégate or a lieutenant of 14 years' seniority, but the period of command for such vessels in European waters will be reduced from two years to eighteen months. The object is to allow a larger proportion of officers to qualify for promotion ; the regulations for promotion to capitaine de vaisseau requiring three years' sea service as capitaine de frégate, one year of which must have been in command.

M. Julien Viaud, lieutenant de vaisseau, better known as Pierre Loti, the celebrated novelist and French academician, has been placed on the retired list. He is 48 years of age, and had 17 years' service in his rank.

The Minister of Marine has fixed the following as the length of time for which commands at sea are to be held for the future :—In the Mediterranean and Channel Squadrons :—Capitaines de vaisseau, two years ; Capitaines de frégate, eighteen months ; Lieutenants in command, two years.

In Foreign Squadrons :—Two years for all three ranks.

In Training-ships : — Capitaines de vaisseau, two years ; Capitaines de Frégate, eighteen months ; Lieutenants in command of tenders, two years.

On Local Stations :—Tonquin, Guinea and Society Islands, and the Directors of Submarine Defences, two years ; in Algeria, Tunis, Senegal, the Congo, the Bidassoa, stations on the Channel and North Sea, stationnaires at the ports, torpilleurs-de-haute-mer, the *Défenses Mobiles* in France, Corsica, Algeria, and Tunis, eighteen months ; torpedo-boats of the *Défense Mobile* in France, one year ; Corsica, Algeria, and Tunis, eighteen months ; and in Saigon, two years.

For Ships in the Reserve :—Capitaines de vaisseau and Capitaines de frégate eighteen months, with six months' extension if their services are specially required ; Lieutenants in command, one year.

The mobilisation of the Northern Squadron, about which so much has been made in the papers, had nothing very unusual in it. The ships of this squadron are not kept fully manned for the whole year, but only during the eight months of the fine weather season, and for the remaining four months the two divisions remain at Brest and Cherbourg with reduced complements. The date fixed for completing the ships as usual was the 1st April, and advantage was taken of this circumstance to test the mobilising arrangements which have been recently re-organised, and orders were given to Brest and Cherbourg accordingly. One of the points it was wished to ascertain was the time it would take to complete the vessels fully with stores and men, as in time of war, after the order to mobilise was received, and a report with any suggestions for improvement was ordered to be sent in afterwards by the maritime prefects of the two ports. The mobilisation took place on 21st March at Brest and Cherbourg on receipt of telegraphic orders to mobilise from the Minister of Marine. Work commenced at 8 a.m. Full supplies of coal and stores were embarked, and all unnecessary gear was landed, and the complements of the ships filled up to full strength from the naval depôts.

At Cherbourg the 2nd Division was mobilised by noon, having taken in 1,800 tons of coals and completed with provisions and stores to 45 days, and in the evening the squadron weighed and anchored off Cape Lévi.

At Brest almost the same celerity was observed ; at 2 p.m. the signal being made from the "Hoche" to light fires, and at 6 p.m. the ships proceeded out and anchored in the bay of Lauberbach. The Minister of Marine has addressed letters to the maritime prefects congratulating them on the smartness displayed and the good working of the mobilising arrangements.

The 2nd Division proceeded from Cherbourg for Brest on 26th March to oin the 1st Division and make an attack on Brest, the two cruisers "Friant" and

"Épervier," of the 1st Division, with the sea-going torpedo-boats "Mangini" and "Ariel," being sent out from Brest to oppose them. An unfortunate accident happened to this latter squadron, reminding us of the collision between the "Phaeton" and "Thrasher" last year. On the night of the 27th March, off Roscoff, at 1·20 a.m., the "Friant" collided with the "Ariel," striking her in the after-compartment, her stem penetrating the officers' cabin; boats were at once lowered from the "Friant," and the crew of 3 officers and 25 men were saved. Attempts were made to tow the "Ariel," but she shortly after sank in 40 fathoms. It is reported that the "Ariel" was attempting to cross the bows of the "Friant" when, through miscalculation of the distance, the collision took place.

Orders have been received by the naval authorities at Ajaccio to commence work on the port of Bonifaccio as a station of the mobile defence. The western part of the port is to be fitted up so as to furnish shelter for the torpedo-boats in reserve, and the work will cost 56,000 francs. It is proposed also to improve the torpedo station at Ajaccio by building a quay wall 110 metres long, 35 metres from the shore, filling in the intervening space, and erecting coal stores and other accommodation for the mobile defence on the reclaimed ground. The estimated cost of this work, which is not yet approved, is 40,000 francs.

A boom defence has been prepared for closing the "goulet de Brest" against torpedo-boats and was tried recently, in the presence of Vice-Admiral Fournier, with satisfactory results. Several attempts were made to break through by an old hulk towed at speed by a tug, but the boom at each trial resisted the strain.

The first-class torpedo-boats 156, 157, 103, and 140 have been detached from the *Défense Mobile* of Toulon and sent to Biserta to reinforce the *Défense Mobile* of Tunis.

The following are the proposed changes during the current quarter:—

Cherbourg.—The first-class battle-ship "Hoche," on being relieved by "Masséna," will pay off into the Reserve; the second-class cruiser "Catinat," if trials are concluded, will join the Squadron of the North; the torpedo-avisos "Fleurus," "Dunois," and torpilleur-de-haute-mer "Cyclone," will commission for trials.

Brest.—The second-class cruiser "D'Assas," if she completes her trials, will join the Reserve Squadron of the Mediterranean; the first-class battle-ship "Masséna," if she completes her trials, will relieve the "Hoche;" the first-class battle-ship "Amiral Baudin" will make her trials if her repairs are completed.

Lorient.—The third-class cruiser "Laclocheterie" commissions (1st April) for Newfoundland; the first-class aviso "Alcyon" commissions to relieve the "Cigogne" in the Congo; the second-class aviso "Lézard" will commission to relieve the "Salamandre" in Senegal; the second-class aviso "Héron" from Senegal will pay off.

Rochefort.—The third-class cruiser "Lavoisier" after her trials proceeds to the Mediterranean.

Toulon.—The torpedo-boat destroyer "D'Iberville" is to be withdrawn from the Active Mediterranean Squadron and placed in the 2nd Category of the Reserve; the torpedo-aviso "Flèche" after repairs will go through her trials; the first-class battle-ship "Bouvet," if she concludes her trials, will relieve one of the battle-ships attached to Active Squadron of Mediterranean Fleet, which will be placed in the Reserve (ship to be relieved not yet settled); the first-class despatch-vessel "Amiral-Parseval" from the Pacific will be paid off; and the Reserve Division of the Mediterranean Squadron will complete to full effective strength towards the end of June.

Sénégal.—The despatch-vessel "Salamandre" on the arrival of the "Lézard" at Dakar will be paid off and condemned; the despatch-vessel "Héron" will

commission in June at Dakar and be navigated by the crew of the "Salamandre" to Lorient, where she will pay off.

Congo Français.—On the arrival of the "Alcyon" at Libreville, the despatch-vessel "Cigogne" will be paid off and condemned.

Cochin-China.—The second-class despatch-vessel "Bengali" will be paid off into the Reserve at Saigon, her crew turning over to the gun-boat "Vipère," which will take her place."—*Le Yacht, Le Temps*, and *Les Tablettes des deux Charentes.*

GERMANY.—The following are the principal promotions and appointments which have been made: Kapitäns zur See—Freiherr von Bodenhausen to be Rear-Admiral; A. Thiele to Command of 1st Seamen's Division; Oelrichs to "Stosch"; Zeye to "Friedrich Karl" and Presidency of Torpedo-experimental Committee; Büllers to "Charlotte"; Scheder to "Bayern"; Schröder (Ludwig) to "Moltke"; Rosendahl to Command of Naval Brigade at Kiauchau; Jaeske to "Stein." Korvetten-Kapitäns—Franz to "Pelikan" and Presidency of Mining-experimental Committee; Kretschmann to "Sophie"; Reincke to "Arcona"; Hoepner to "Schwalbe"; von Colomb to Command of a Torpedo-boat Flotilla; Deubel to Command of the Armoured Gun-boat Division; Wilde to "Albatross"; Sommerwerck to "Hela"; Coerper to be Naval Attaché to the Embassy in London; Freiherr von Schimmelmann to be Naval Attaché to the Northern Powers, with Head-quarters at St. Petersburg; von Dassel to "Condor."—*Marine Verordnungsblatt.*

The Imperial Government has at last succeeded in passing their Navy Bill through the Reichstag. Rear-Admiral Tirpitz, the Secretary of the Navy, stated in his Report, that "The strength in ships of the German Navy, exclusive of torpedo-boats, training-ships, special-service vessels, and gun-boats, is to be fixed as follows:—There should be ready for service 17 line-of-battle ships, 8 armoured ironclads for coast defence, nine large and 26 small cruisers. Two battle-ships and 3 large and 4 small cruisers are to be provided as a reserve force."

At present, if the ships which will be available for service or which will be in construction on 1st April, 1898, be included, the German Navy consists of 12 battle-ships, 8 ironclads for coast defence, 10 large cruisers, and 23 small cruisers. In order to realise the Government plans, 7 battle-ships and 2 large and 7 small cruisers must be built before the close of the financial year 1904–5.

The Admiralty consider that the period of efficiency for battle-ships and ironclads for coast defence may be reckoned at 25 years, for large cruisers at 20 years, and for small cruisers at 15 years, and the Imperial Diet has been accordingly asked to undertake that the votes for renewals shall be granted in the estimates at the proper time.

The Reichstag has agreed that the strength of the Navy—exclusive of torpedo-vessels, training-ships, and gun-boats—is to be as follows:—One flag-ship, two squadrons of eight first-class battle-ships each, two divisions of four armoured coast-defence vessels, thirteen armoured gun-boats, six large and sixteen small cruisers for home service, and three large and ten small cruisers for service abroad; there is to be a reserve consisting of two battle-ships, three large and four small cruisers. The ships already existing or in course of construction are twelve battle-ships, eight coast-defence battle-ships, thirteen armoured gun-boats, ten large and twenty-three small cruisers. The estimates for keeping torpedo-boats, ships on foreign service, training-ships, special-service vessels, and gun-boats in commission will be left to be decided by the exigencies of each year.

With regard to the complement of men, the Admiralty have demanded that the Reichstag shall make provision in advance for officers, petty officers, and bluejackets, as well as dock and torpedo-boat hands, on the following scales:—

1. One-and-a-half times the complements required for ships on foreign service. 2. Full complements for ships belonging to active formations of the home fleet, for half the number of the torpedo-boats, for all the training-ships and special service vessels. 3. Cadres for the complements of ships belonging to the reserve formations of the home fleet and for the other half of the torpedo-boats. 4. The necessary complements for land service. 5. A margin of 5 per cent. additional on the whole. The naval interests of the German Empire require the presence abroad of three large cruisers, two in East Asia, and one for Central and South America; of ten small cruisers, three in East Asia, three for Central and South America, two for East Africa, and two for the South Seas; of four gun-boats, two for East Asia and two for West Africa, and of one stationary vessel for Constantinople. But in the present year there were available for the purposes enumerated only two large and eight small cruisers, two gun-boats, and one station ship, and in order to provide even this force for foreign service the home fleet had to be deprived of three of its best cruisers.

The following statement submitted by the Government, the first amount under each heading representing in millions of marks the Naval Estimates for the current financial year, the succeeding seven amounts representing the contemplated estimates for each financial year from 1898 to 1905:—

—	1897-98.	1898-99.	1899-1900.	1900-1.	1901-2.	1902-3.	1903-4.	1904-5.
Constructions, including artillery and torpedo armament	49·1	51·4	55·5	64·6	64·3	62·4	58·5	53·6
Other non-recurrent expenditure	9·0	7·7	8·7	8·7	8·7	8·7	8·7	8·7
Recurrent expenditure ...	59·4	62·6	67·4	71·4	75·4	79·4	83·4	87·4
Total Naval Estimates ...	117·5	121·7	131·6	144·7	148·4	150·5	150·6	149·7

Total amount demanded for the septennate—997,200,000 marks (£49,860,000).

The total sum required, which has now been voted, will, however, require to be redistributed, as the Reichstag has authorised the completion of the new programme in six years instead of in seven, as the Government proposed.

It is contemplated in the future to have only three classes of ships, viz., battleships proper, and cruisers classed large or small. The designs for the new ships are now being prepared. The dimensions of the large cruisers are reported to be as follows:—Length, 390 feet; beam, 63 feet 6 inches; with a displacement of 8,860 tons, and engines developing 15,000-I.H.P., to give a speed of 20·5 knots; they will thus be nearly 2,000 tons smaller than the "Fürst Bismarck," but with 2,000 more I.H.P., giving them a knot and a half more speed. The armament will consist of two 24-centimetre (9·4-inch) guns in armoured turrets, one forward and one aft, ten 15-centimetre (5·8-inch) Q.F. guns, ten 8·7-centimetre (3·4-inch) Q.F. guns, ten 3-pounder Q.F. guns, with three torpedo-tubes; the ships will be driven by three screws. The first vessel of this new type is to be begun as soon as possible.

On the 12th ult. the "Hansa," the fifth and last of the new second-class cruisers of the "Freya" type, was launched from the Vulcan Yard at Stettin. Her dimensions are as follows:—Length, 344 feet 5 inches; beam, 57 feet; and with a maximum draught of 21 feet 8 inches, a displacement of 5,650 tons. The ship will be driven by triple screws, the engines developing 10,000-I.H.P., to give a speed of 20 knots. The normal coal stowage will be 500 tons, but 950 tons can

be carried, increasing the displacement to 6,100 tons, provision being also made for liquid fuel. The armament will consist of two 21-centimetre (8·2-inch) Q.F. guns in armoured turrets, one forward and one aft; four 15-centimetre (5·8-inch) Q.F. guns in armoured casemates, and four similar guns in small armoured turrets; ten 8·8-centimetre (3·4-inch) Q.F. guns protected by shields, 18 small Q.F. and machine guns with three submerged torpedo-tubes.

On the 31st ult. the new fourth-class cruiser "Gazelle" was launched from the Germania Yard at Kiel, Princess Henry of Prussia performing the christening ceremony, attended by Admiral Knorr, the Commanding Admiral of the Navy, and other high officials. Her dimensions are as follows:—Length, 325 feet; beam, 38 feet; a displacement of 2,600 tons, with engines developing 6,000-I.H.P., to give a speed of 20 knots.

On the 1st inst. the cruising frigates "Stosch" and "Moltke" were commissioned to take the place of two sister-ships, the "Stein" and "Gneisenau," while the fourth-class cruiser "Schwalbe" was commissioned to relieve the fourth-class cruiser "Seeadler" on the East Indian station. The ex-school ship "Olga" has been commissioned for six months' service for fishery-protection duties in the North Sea, taking the place of the torpedo-aviso "Zieten." At Danzig the third-class battle-ship "Bayern," which has been undergoing extensive repairs, hoisted the pennant on the 1st inst., and, after her trials, will be attached with the 'Baden," a sister-ship which, after similar repairs, is now undergoing her trials at Kiel, to the Manœuvre Squadron. In the beginning of May the two new second-class cruisers "Hertha" and "Victoria-Louise," completing at the Vulcan and Weser Yards respectively, will be commissioned for their trials.

The 1st or Manœuvre Squadron has been constituted as follows under the command of Vice-Admiral Thomsen, with Kapitän zur See Fritze as his Chief of the Staff:—

1st Division:—
First-class battle-ships—"Kurfürst Friedrich Wilhelm" (flag-ship of Commander-in-Chief), "Wörth," "Weissenburg," "Brandenburg."
First-class despatch-vessel—"Hela."
2nd Division under Rear-Admiral Bendemann:—
Third-class battle-ships—"Baden" (flag-ship), "Bayern," "Oldenburg."
First-class despatch-vessel—"Greif."

The remaining squadrons are composed as follows:—

Training Squadron.

Cruising corvettes—"Charlotte," "Stosch," "Moltke," "Nixe," "Sophie."

Cruiser Squadron at present in China.

1st Division:—
First-class armoured cruiser—"Kaiser" (flag-ship of Vice-Admiral von Diederichs, Commander-in-Chief).
Third-class cruisers—"Irene," "Prinzess Wilhelm," "Arcona."
2nd Division:—
First-class armoured cruiser—"Deutschland" (flag-ship of Rear-Admiral H.R.H. Prince Henry of Prussia).
Second-class cruiser—"Kaiserin Augusta."
Third-class cruiser—"Gefion."

On the East Asian Station.

Fourth-class cruiser—"Cormoran."

On the Australian Station.

Fourth-class cruisers—"Buzzard," "Falke."
Surveying-vessel—"Möwe."

On the East African Station.

Fourth-class cruisers—"Condor," "Schwalbe."

On the West Coast of Africa.

First-class gun-boats—"Habicht," "Wolf."

On the East Coast of America.

Fourth-class cruiser—"Geier."

In the Mediterranean.

Despatch-vessel—"Loreley."

The Reserve Division of the Baltic will consist of the following ships:—

Fourth-class battle-ships—"Hagen," "Ægir," "Odin," "Heimdall."

Armoured gun-boat—"Mücke."

Despatch-vessel—"Pfeil."

Reserve Division of the North Sea.

Fourth-class battle-ship—"Beowulf," "Frithjof."

Despatch-vessel—"Zieten."

The torpedo-boat flotilla, under the command of Korvetten-Kapitän von Colomb, will consist of the despatch-vessel "Blitz," division-boats "10" and "8," with twelve torpedo-boats.—*Neue Preussische Kreuz-Zeitung* and *Marine Verordnungsblatt.*

JAPAN.—On 23rd ult. was launched from the Elswick Shipyard of Sir W. Armstrong and Co. the first-class armoured cruiser "Asama." At the luncheon after the launch Sir A. Noble in his speech gave the following description of the vessel, which explains fully her characteristics and her armament:—"The vessel," he said, "that they had seen launched by Madame Arakawa was a remarkable one. Her length was 408 feet, her breadth 67 feet, her mean draught 24 feet 4½ inches, and her displacement 9,700 tons. Her machinery was of the twin-screw triple-expansion type, built by Messrs. Humphrys and Tennant, with a maximum I.H.P. of 18,000, while her armament was very powerful, he might say remarkably so. It consisted of four 8-inch breech-loading Q.F. guns, fourteen 6-inch Q.F. guns, twelve 12-pounder Q.F. guns, seven 2½-pounder Q.F. guns, and five torpedo-tubes, four being submerged, the latter being the class with which, as he had had occasion before to remark, they had achieved a remarkable success. But if he came to the "Asama's" defensive powers they were nearly as remarkable. She had at her water-line a belt of Harveyized steel 7 inches thick, her citadel was 5 inches thick, whilst her barbettes were 6 inches thick. Her conning tower was 14 inches thick and her casemates were 6 inches thick. Her protective deck was 2 inches thick from end to end. Both in the public Press and elsewhere the question of cruisers and armaments had excited much attention of late, and so many comments had been made that he felt impelled to make a few explanatory remarks himself. In the first place, as he had said, the whole of her armour was Harveyized, and they must remember that Harveyized steel was at least equal to one and a half times the defensive power of compound armour. The radius of action of the "Asama" was about 10,000 knots at her most economical speed, and that was more than ample radius of action for the duties she was likely to be called upon to perform. As regards her armament, perhaps the most convenient way of expressing the "Asama's" very great power was by comparing her with the armament of the "Powerful," which was one of the fastest cruisers in Her Majesty's Service. The main armament of the "Powerful" consisted of two 9·2-inch breech-loading guns, twelve 6-inch Q.F. guns, fourteeen 6-inch Q.F. guns, and eighteen 12-pounders; whilst the armament of the "Asama" amounted to four 8-inch Q.F. guns, fourteen 6-inch Q.F. guns, and twelve 12-pounder guns. But they would observe that the whole broadside of the "Powerful" throws only a weight of shot at a single broadside amounting to 1,472 lbs., while the broadside of the "Asama" amounted to no less than 1,775 lbs. They would remember also that the "Powerful" was a vessel of, he thought, 14,500 tons displacement, whilst the "Asama" was only of 9,700 tons displacement, and her maximum speed was 21½ knots. Turning to the guns, those 8-inch guns of the "Asama" had a maximum

muzzle velocity of 2,560 feet per second; but, for reasons which he should come to presently, it was not desirable that that high velocity should generally be used. It was a mistake to suppose that such high velocities were new. That firm had turned out and armed many ships with guns of a velocity of over 2,500 feet per second. Further, they made experiments to show that with the new explosives that were now in general use elsewhere, it was possible to get, taking the 6-inch guns as an instance, a velocity of about 3,000 feet per second. But it would be in the highest degree unwise to use those very high velocities, except for very exceptional occasions, the reason being that the erosion was so extremely rapid that in a very few rounds the velocity falls off enormously, to the extent of 300 feet or 400 feet, and in comparatively few more rounds the gun becomes unserviceable, and requires relining, simply because the surface of the bore is swept away by the heat and pressure of the charge. It was also a mistake to suppose that it was a novelty to fire those high velocity Q.F. guns without the use of brass cartridge cases. The Elswick firm had turned out Q.F. guns of all sizes for some years without cartridge cases. But the point was, perhaps, too technical to dwell upon there. Both cartridge cases and guns without cartridge cases had their defects and had their advantages. With very high velocities it was, perhaps, preferable to dispense with the cartridge case, but that was a question that was open to discussion."—*Engineer.*

SPAIN.—In view of the probable outbreak of hostilities with the United States it may be interesting to give some details as to the naval forces Spain has available in the event of war.

Her only battle-ship is the "Pelayo," a vessel of 9,900 tons displacement, built in France at the La Seyne Yard, near Toulon, and launched in 1887; she has lately undergone extensive repairs at the same yard, and Niclausse water-tube boilers have been substituted for her old cylindrical ones; she made 16 knots on her recent trial trip, and has since arrived at Cartagena. Protection is afforded by a complete water-line belt 17 inches in thickness, but tapering to 12 inches at the bow and stern, with two 15·7-inch transverse bulkheads, one forward and one aft, while there is a 4-inch armoured deck. The armament consists of two 32-centimetre (12·5-inch) 48-ton Hontoria guns in armoured barbettes, one forward and one aft; and two 28-centimetre (11-inch) 38-ton Hontoria guns, also in armoured barbettes, one on each beam. All four turrets are protected by 18-inch armour with 6-inch steel hoods for the guns. The secondary battery now consists of nine 5·5-inch Q.F. guns, mounted one right forward and four on each beam in a central battery, with 20 small Q.F. and machine guns and 7 torpedo-tubes. The engines develop 9,000-I.H.P., giving the ship a speed of 16 knots, while the coal supply is 1,000 tons.

She possesses five powerful armoured cruisers ready for sea, the finest being the "Cristobal Colon," purchased last year from the Italian Government. This vessel has a displacement of 6,840 tons, with engines developing 14,000-I.H.P., giving a speed of 20 knots; protection being afforded by a 6-inch complete belt of hardened steel, above which is a central redoubt, 120 feet long, similarly protected, at each extremity of which are barbettes also with 6-inch plating, one forward and one aft, with 6-inch transverse bulkheads protecting their bases, a 10-inch gun with steel hood being mounted in each; in the redoubt are mounted ten 6-inch Q.F., and on the superstructure six 4·7-inch Q.F. guns, with 20 small Q.F. and machine guns; her coal capacity is 1,000 tons. The other four vessels are the "Vizcaya," of which we give a photograph in the frontispiece; "Infanta Maria Teresa," "Almirante Oquendo," and "Emperator Carlos V." The first three are sister-ships, vessels of 7,000 tons, with engines developing 13,000-I.H.P., giving a speed of 20 knots; they have a 12-inch belt, with 3-inch armour deck, and carry two 11-inch guns, one forward and one aft in barbettes protected by 10·5-inch armour, the guns being protected by hoods, while the

secondary battery consists of ten 5·5-inch Q.F. guns, with 20 small Q.F. and machine guns and 8 torpedo-tubes. The "Emperator Carlos V." is of a somewhat different type, as she has no belt, but instead a 6·5-inch turtle-back armoured deck, a central battery protected by 2-inch armour for her 5·5-inch Q.F. guns, the barbettes for her two 11-inch guns having 10·5-inch armour; her displacement is 2,000 odd tons larger, being 9,235, while her engines develop 18,500-I.H.P., but she is only credited with the same speed, viz., 20 knots. There are four other vessels of the "Vizcaya" type under construction and completing, one of which—the "Princesa de Asturias"—is nearly ready for sea, and it is further reported that the Government have purchased the first-class armoured cruiser "Varese" (a sister-ship to the "Cristobal Colon") from the Italian Government, but she will not be ready for sea for some time yet.

Of smaller cruisers of any value with speeds from 14 to 20 knots, Spain has 24, and of these the "Alfonso XII.," a cruiser of 5,000 tons and engines of 11,000-I.H.P., with a speed of 20 knots, is the largest; but 11 out of the 24, it should be noted, are vessels of under 1,000 tons displacement, although they all have speeds varying from 18 to 20 knots; and she has, moreover, a powerful little flotilla of five 30-knot torpedo-boat destroyers, all lately completed by Thomson, of Clydebank. Although the Spanish Navy is not likely to be able to effect much against the coast-towns of the United States, defended as they will be by the powerful home-defence fleet concentrated there, yet it ought to be able to do effective damage against the now considerable U.S. mercantile marine, especially as it is unlikely that any attack could be successfully made against the Spanish arsenals and seaport towns, from some of which their cruisers could undoubtedly operate against the U.S. trade routes.

UNITED STATES.—In the event of war with Spain, the United States could without doubt easily protect her coast-towns and destroy Havannah and Puerto-Rico, as Spain has no ships which could cope with the five battle-ships, "Iowa," "Indiana," "Massachusetts," "Oregon," and "Texas," all with the exception of the "Oregon," which is on her way from the Pacific, now concentrated at Key West or Hampton Roads. The four first named are first-class battle-ships, of smaller tonnage, but otherwise of very much the same type as our own "Royal Sovereign" class; they carry their four heavy 13-inch guns in turrets placed in pairs, one turret being forward and the other aft of the secondary battery, in which are mounted four 6-inch Q.F. guns, two on each beam, while on the upper deck are four smaller turrets, two on each beam, in each of which are mounted two 8·8-inch guns, which makes their armament somewhat heavier than in our ships. In the "Iowa" the turrets for the heavy guns are plated with 15-inch armour, and the smaller turrets with from 6-inch to 8-inch. She also has a belt of 14-inch steel extending about three-fifths of the vessel's length, and finished off with a 3-inch deck to stem and stern. Above this belt there is vertical armoured protection to the height of the main deck, 5 inches thick, with bulkheads fore and aft of 12 inches. The "Indiana," "Massachusetts," and "Oregon" have similar protection; the partial belt being 18 inches thick with a 5-inch belt above carried to the upper deck, and fore and aft bulkheads of 17 inches, while the turrets are protected by 17-inch and 6-inch armour respectively; but their coal supply is so small that it is unlikely they would attempt to cross the Atlantic, and they are, moreover, not good sea-boats; but in smooth water and fine weather they are very formidable vessels. The "Texas" is a second-class battle-ship of 6,000 tons, and up to the present has had an unfortunate career; she carries two 12-inch guns in turrets placed "en échelon," protected by 12-inch armour, and has a 12-inch water-line belt extending about two-thirds of her length, a deck of 3-inch steel and transverse 12-inch bulkheads. In addition to these ships, the U.S. Navy possesses six very powerful turret-ships for coast defence, viz., the "Monterey," "Puritan," "Amphitrite," "Monadnock," "Terror," and "Miantonomoh." Of these, the first-named is stationed on the Pacific

Coast; they are useless in rough weather, and their coal supply is so small that they are tied to their own coast, but for harbour defence they will doubtless prove valuable.

Of cruisers, in the "New York" and "Brooklyn" the United States has two formidable vessels, both having armour water-line belts, 4 inches thick in the first-named, and from 3 inches to 7 inches in the "Brooklyn"; both ships are also well armed, the "Brooklyn" carrying eight 8-inch guns, and the "New York" six, besides a formidable battery of twelve 5-inch Q.F. guns and some 16 smaller Q.F. and machine guns; the heavy guns are, moreover, in turrets protected by armour, varying in the "New York" from 10 to 7 inches, and in the "Brooklyn" from 8 to 5 inches. Both ships have armoured decks 6 to 3 inches thick. The engines in both ships develop over 17,000-I.H.P., giving them on the measured mile a speed of 21 knots, and their coal supply is good, amounting in the "Brooklyn's" case to 1,700 tons.

Of other cruisers large and small with speeds varying from 15 to 21 knots, the United States possesses 23, including the two commerce-destroyers (so-called) "Columbia" and "Minneapolis," both of which were credited with a speed of 23 knots on their trial trips. The "Columbia," however, on her full-speed run from Southampton to New York, only averaged 18 knots, burnt all her coal, and arrived at the end of her trial with engines and boilers in a decided state of collapse; the "Minneapolis" has never been subjected to any such severe test, and many of the other cruisers are credited with measured-mile speeds which, owing to the conditions under which these trials are made, are in most cases far in excess of the real sea speed of the ships. The coal supply of many of these vessels is small, and the want of coaling stations must most materially hamper them in their efforts to protect their trade. The two finest and most reliable of the U.S. cruisers are probably the "Olympia" and "Philadelphia," which have a fairly good coal supply and in favourable circumstances could probably be relied on to do their 20 knots.

The Government have made provision for the construction of three torpedo-boat destroyers, which are to cost £50,000 each. They are to be built by contract and the designs are left in the hands of the contractors. The first craft contracted for is the "Bailey," the price being $210,000; she will be built at Morris Heights, in the State of New York, and she will be the first destroyer to be built in the port of New York. The Government laid down certain general conditions, such as the speed was to be 30 knots at the measured-mile trial, she was to carry a defined armament, and she must be able to berth forty officers and men. The builders have agreed to fulfil all these conditions and hope to get a speed of 33 knots out of the craft. War-vessels in the United States have not hitherto been unvarnished successes, and indeed have speedily fallen off from their first glory, the reason for which probably was to be found in the premium system. In this case the conditions will not permit of much scamping in the building. She is to be of a length of 205 feet and beam of 19 feet. The depth of hold is to be 13 feet 5 iches. Displacement at trial 235 tons, at commission 265 tons. At trial her weights are to be:—Hull 67·5, machinery 115, water 10, ordnance 12·6, coal 20, and equipment 9 tons. In the matter of armament her outfit is considered to be heavy for her size. She will carry four 6-pounder rapid-fire guns and three 18-inch Whitehead torpedo discharge tubes. The Q.F. guns will be mounted on the main deck, two amidships and two in the conning tower platforms. All the guns will have a great range of fire. The speed called for by the Government is much beyond anything yet in the United States Navy. In this case the engines will be four cylinder triple-expansion, of 20, 30½, and 32 inches, and a common stroke of 18 inches. The engines are designed to give 5,600-H P. when making 400 revolutions a minute. The boilers of the "Bailey" are to be four in number, of a water-tube variety, with two furnances to each. The working pressure will be 250 lbs.

MILITARY NOTES.

PRINCIPAL PROMOTIONS AND APPOINTMENTS DURING MARCH, 1898.

General Sir F. C. A. Stevenson, G.C.B., to be Constable of the Tower of London; General Sir Richard Harrison, R.E., K.C.B., *p.s.c.*, to be Inspector-General of Fortifications; Major-General G. Salis-Schwabe, *p.s.c.*, to be Lieut.-Governor and Secretary, Royal Hospital, Chelsea; Colonel Sir J. C. Ardagh, K.C.I.E., C.B., *p.s.c.*, late R.E. (temp. Major-General), H. J. Hallowes (temp. Major-General), H. C. Borrett, and J. Boughey, *p.s.c.*, to be Major-Generals; Lieut.-Colonel F. R. Wingate, R.A., C.B., D.S.O., Egyptian Army, to be extra Aide-de-Camp to the Queen and brevet Colonel; Colonel A. G. Wavell, *p.s.c.*, from 42nd Regimental District, to be A.A.G. for Recruiting at Head Quarters; Colonel J. Stevens, C.B., Army Ordnance Department, to be Principal Ordnance Officer (ranking as Major-General); Colonel R. C. Hare, late Cheshire Regiment, to command the 63rd Regimental District; Surgeon-Major-General C. E. McVittie, and Surgeon-Colonel B. Franklin, C.I.E., to be Hon. Physicians to the Queen.

HOME.—A decisive engagement between the Anglo-Egyptian force under the Sirdar, Major-General Sir H. H. Kitchener, and the Dervish force under Mahmoud, was fought on Good Friday last. On the 17th March, the Anglo-Egyptian Army was concentrated in an impregnable position at Kunar, the Dervishes being at El Aliab, 25 miles from the Atbara. Mahmoud's force left El Aliab on the 18th, and, in order to prevent his passing north by the desert road, the Sirdar left Kunar and arrived on 21st March at Ras el Hudi, a good camp with its right resting on the Atbara. By this means he gained a great advantage over Mahmoud, and prevented him from even raiding in the direction of Berber. Fighting took place at Adamara, 70 miles up the Atbara, when the Dervishes were defeated in an attack on that post held by friendlies; and on the 21st and 22nd March between the Sirdar's men and some cavalry of the Dervishes, whose entire force had left El Aliab on the 18th. On the 26th March the Dervish position at Shendy was attacked by a force composed of the 15th Egyptian Battalion and two guns, under Major T. E. Hickman, D.S.O., Worcestershire Regiment, conveyed in three gun-boats under Commander C. R. Keppel, R.N., D.S.O. The forts were destroyed, a quantity of grain, cattle, and ammunition captured, and over 600 slaves liberated. The loss on the Dervish side amounted to 160, but there were no casualties in the Egyptian force. A reconnaissance by Major-General A. Hunter, on the 31st March, discovered the Dervish Army in a strongly entrenched camp in the bush at Nackheila, 18 miles from the Sirdar's camp. The enemy's camp covered 3 miles of ground. On the 4th April the Anglo-Egyptian Army, under the Sirdar, marched to Abadar, within 14 miles from Mahmoud's position. On the following day a reconnaissance in force, under Major-General A. Hunter, was made towards the enemy's camp, and some fighting took place. The Egyptian cavalry halted at about 800 yards from the Dervish position, which was reconnoitred to within 200 yards under cover of a heavy fire from the Krupp battery and the Maxim guns. In the meantime two bodies of the enemy's horsemen, supported by riflemen, emerged from either end of the zareeba and rode round the flanks of the Egyptian cavalry, who, charging them with some confidence, compelled them to withdraw. The enemy's loss was estimated at 200; the Egyptian at 16 killed and wounded, among the latter being Captain W. H. Persse, Queen's Bays. On the 6th April the Anglo-Egyptian force marched from Abadar to Umdabia, 7 miles from the Dervish position.

At 6 p.m., on 7th April, the Anglo-Egyptian Army left Umdabia, bivouacked in the desert, arrived within a mile from the enemy's position at 6 a.m., and advanced to within 500 yards of their trenches. The Sirdar's force amounted to about 13,000 men, with 24 guns and 12 Maxims; the enemy's force was similar in

strength. Fire was opened on their position on Good Friday morning, the first gun being fired at 6.15 a.m. After a heavy bombardment of the trenches, three brigades—

British, under Major-General W. F. Gatacre, C.B., D.S.O.,
Soudanese, Lieut.-Colonel J. G. Maxwell, D.S.O.,
Soudanese, Lieut.-Colonel H. A. MacDonald, C.B., D.S.O.,

formed for attack, the British being on the left, MacDonald's next, and Maxwell's on the extreme right. The zareeba was rushed, and the position carried without a check. The Dervishes fought well; their losses amounted to over 2,000, and 4,000 were taken prisoners, including Mahmoud, their general. The losses in the British Brigade amounted to over 100 killed and wounded, including Captains B. C. Urquhart and C. Findlay, 1st Cameron Highlanders, and 2nd Lieutenant P. A. Gore, 1st Seaforth Highlanders, who were killed; and the following, who were wounded:—Lieutenant MacG. Greer, 1st Royal Warwickshire; Colonel T. E. Verner and Lieutenants H. E. R. Boxer and C. J. Rennie, 1st Lincolnshire; Colonel R. H. Murray, C.B., Captains N. C. Maclachlan and A. C. D. Baillie, and Lieutenants N. A. Thomson and R. S. Vandeleur, 1st Seaforth Highlanders; Major R. F. L. Napier, 1st Cameron Highlanders. The following officers serving with the Egyptian Army, but not attached to regiments, were also wounded:—Major H. P. Sheckleton, South Lancashire Regiment; Major W. F. Walter, Lancashire Fusiliers; Captain Hon. C. E. Walsh, Rifle Brigade; and Lieutenant H. K. Harley, D.S.O., Indian Staff Corps.

Rapid progress is being made with the railway. On 22nd August, 1897, it was completed to 138 miles south of Wady Halfa, on 2nd October to 184 miles south of Wady Halfa, and 15 miles from Abu Hamed. On the 8th November it had been laid down to 5 miles south of Abu Hamed, and on the 15th March, 1898, it had reached Bashtinab, north of the fifth cataract, thus extending it to 73 miles south of Abu Hamed, and 306 miles from Wady Halfa.

A very important contribution to the controversy regarding the second capture of the Dargai ridge appears in the April number of the *Proceedings of the R.A. Institution*, by Lieutenant G. F. MacMunn, D S.O., R.A., who watched the operations from Shinwari. It dispels the doubt that has hitherto existed as to the value of the artillery fire on that occasion, and the insufficiency of the weight of their metal. The fight on the 20th October commenced by the batteries shelling the enemy's fortified positions. Dargai was only approachable in front by a narrow neck without cover, commanded by heights 300 to 400 feet above it at a range of some 500 yards After crossing the neck, the troops had to scramble up to the top, with only room for men in single file. The outline of the infantry attack was as follows:—The 3rd Infantry Brigade, under Brigadier-General F. J. Kempster, A.D.C., D.S.O., attacked, the 1st Bn. 2nd Gurkhas leading, supported by the 1st Bn. Dorsetshire Regiment and the 2nd Bn. Sherwood Foresters. The 1st Bn. Gordon Highlanders and the 3rd Sikhs. The Gurkhas, Dorsetshire, and Sherwood Foresters, after several plucky attempts, were unable to cross the dangerous neck. The attacks were always preceded by a perfect artillery fire on some 300 yards of front, now concentrating at one point, now distributed over the whole line; but the fire ceased while the infantry made their attempts.

The fatal neck was soon covered with our dead and dying and not a man could show himself without being hit. Indeed, any wounded man who tried to crawl to cover, or who even stirred, was at once riddled; some of our men had as many as six bullets through them. The enemy, perfect marksmen, were in position 300 feet above on cliffs behind sangars, were armed with Martinis, Sniders, and even Lee-Metfords, and they had abundance of ammunition. The artillery fire and infantry fire does not appear to have distressed them. In view of this, and considering that there appeared to be 400 or 500 yards steep climb in single file up an equally bare cliff side, it is not to be wondered that our troops hesitated and asked if the frontal attack was to be pressed home. Orders, however,

were received that the ridge must be carried at all costs, and, accordingly, a heavy, continuous artillery fire was again opened, culminating in a few minutes of very rapid shrapnel and ring fire.

In the meantime, the 1st Gordon Highlanders and the 3rd Sikhs were ordered up, and Colonel Mathias addressed the now historical words to his regiment. Directly the play of rapid fire ceased, Colonel Mathias stepped to the front with his pipers and the leading company officers, and the advance began, the pipers striking up, some the "Cock o' the North," and others the "Haughs o' Cromdale." Those who were present say it was worth living for, to see the air with which the Pipe-Major swung his plaid and drones back over his shoulder as he stepped to the front. Thus led, the Gordons, almost simultaneously with the head of the 3rd Sikhs, rushed across the small fatal neck, both corps losing heavily. The success which followed is well known. A confused mass of Highlanders, Sikhs, Gorkhas, Dorsets, and Derbyshire men surged up the ridge, cheering wildly with all the excitement of dearly-bought victory. It was a severe trial to men's nerves, and the discipline and *élan* which took the Highlanders and Sikhs across that hitherto impassable patch already covered with corpses, was beyond all praise.

The total casualties amounted to 205, almost all occurring on the fatal neck on a piece of ground about the size of a tennis court.

The fire of the artillery seems to have been most effective, and an examination of the enemy's position showed that for 20 feet below the crest and on every rock or ledge and sangar on it, there were two or three bullet splashes per square foot, for at least a front of 300 yards, caused by the bursting shell. Mr. McMunn is of opinion that no troops in the world could have taken the position if the enemy had kept up the fire as it was at the commencement, and he considers that the artillery fire must have inflicted considerable loss upon them. Reviewing the Dargai fight as a whole, and after going over the ground carefully, he writes:—"The artillery fire made the Gordons' determination of avail; without it they would only have been rolled back almost annihilated."

Mr. Brodrick's Bill to amend the law relating to the Army Reserve and the Militia is a fulfilment of the intention of the authorities conveyed in the War Secretary's memorandum relating to the Army Estimates. Despite the advantages claimed for the short service system and a reserve it cannot be denied that for small wars which are not of national emergency, such as this country frequently engages in, the Reserve has not hitherto proved satisfactory. The military authorities are powerless to stiffen the home battalions, which are admittedly unfitted for fighting purposes, with a single man from the Reserve for the purposes of a small war. The result is that the greatest difficulty is experienced in raising 5,000 men to go anywhere without splitting up battalions. One of the objects of Mr. Brodrick's Bill is to facilitate the preparation of a force for special service out of the United Kingdom, when required, from the battalions at home, without mobilising the Reserve. It will enable infantry soldiers on leaving the colours to undertake voluntarily liability to recall during their first year of Reserve service. Men who assume this liability will receive extra Reserve pay of 6d. per day, making, with their ordinary Reserve pay, 1s. in all. The number of these special Reservists is to be limited to 5,000. The other object of the Bill is one of equal importance, and refers to the service of the Militia abroad. As Lord Wolseley recently remarked, if this country engaged in an important war, the Militia would be at once embodied and expected to garrison most of the foreign stations. According to present Act of Parliament, the Militia may be embodied "in case of imminent national danger or of great emergency"; but the Force cannot be ordered out of the United Kingdom, but must volunteer. The Government will be able, if the Bill becomes law, to at once reinforce the English garrison of India with the majority of the troops from the Mediterranean, Egypt, and the Colonies, and replace them by embodied battalions of Militia in case of necessity. It could move all its Regular troops from Malta, Gibraltar, the Channel Islands,

and other places, with the knowledge that their duties could be undertaken by regiments of embodied Militia. It will enable the Government in these days, when time is a very important factor, to concentrate at once at the critical place as many as they wish of their Regular troops.

The Militia can, however, under the present Act, volunteer to serve in Gibraltar, Malta, the Channel Islands, and Isle of Man; and the object of Mr. Brodrick's Bill is to authorise the force to volunteer to serve elsewhere abroad—India, Egypt, Africa, and so on.

It has been definitely decided to raise two additional Regular battalions to each of the following regiments:—The Royal Warwickshire, the Royal Fusiliers, and the Lancashire Fusiliers. Early in March, 1898, instructions were issued to officers commanding regimental districts and battalions requesting them to invite Reservists, rejoining the colours under Army Order No. 23, of February, 1898, to join the Royal Warwickshire Regiment, the Royal Fusiliers, or the Lancashire Fusiliers, it being pointed out to them that in the formation of the new battalions in contemplation, men of good character and education would have chances of promotion and special employment. Instructions were then given for the formation of the new 3rd Battalions from 31st March, 1898, in the following manner:—Two complete companies of the old home battalions, commanded by the two junior captains with two lieutenants and one second lieutenant, were transferred to the new 3rd Battalions as a nucleus, together with all the men who had rejoined from the Reserve, these last to be utilised in the formation of the cadres of four more companies, making six companies in all, in the new battalions. At the same time, arrangements were made for all recruits to join the new battalions for the present as they become available. The appointments to command the new battalions have in each case been made by the promotion of the senior majors in the three regiments. The number of men who have rejoined the colours under Army Orders Nos. 1 and 23 of 1898 up to 2nd April, is as follows:—

Foot Guards...	55
Infantry of the Line	1,963

Of the latter, those who have joined the newly-formed battalions are:—

Royal Warwickshire	192
Royal Fusiliers	123
Lancashire Fusiliers	165

Recruits for the infantry are now being taken for 3 years' colour and 9 years' reserve service, and it is hoped that, with the nucleus of reserve-men which it was decided to give to each of the new battalions, little difficulty will be experienced in completing each of them to strength. The 3rd Battalion of the Royal Warwickshire, raised at Chatham, arrived at Aldershot on the 1st instant; the 3rd Royal Fusiliers is being formed at the Curragh, and the 3rd Lancashire Fusiliers at Preston. In the meantime the 1st and 2nd Battalions of the Scots Guards have been increased by one company each, with a view to the early formation of their third battalion.

The regiment of Rifles now being raised in India for service in Uganda will consist of 400 men—200 being Sikhs and the remainder Punjabi Mahomedans. The men will be seconded in their regiments for three years only. Ten Punjabi Mahomedans only will be allowed to be drawn from any one corps. The Sikhs may be taken in unlimited numbers from Bombay regiments. The pay has been fixed as follows:—Subadars Rs.200, Jamadars Rs.100, Havildars Rs.30, Naiks Rs.25, and Sepoys Rs.18, and at the end of the service of three years gratuities will be given. Captain J. T. Evatt, 39th Garhwal Regiment, has been approved commandant of the corps. The double company commanders will be Captains

E. J. E. Swayne, 16th Bengal Infantry, and W. W. Chitty, 19th Bombay Infantry. Lieutenant M. L. Hornby, 2nd Punjab Infantry, has been approved adjutant and quartermaster. The wing officers will be Lieutenants H. B. Rattray and F. S. Keen, 45th Sikhs. The regiment is being organised and equipped at Poona and will shortly proceed to join the forces in the Protectorate. It is intended that it should act as a model battalion, and that any local forces which may from time to time be raised should be organised on the same basis.

A revised edition of the General Regulations for the Equipment of the Regular Army has been issued from the War Office, and a good deal of new matter relating to mobilisation has been introduced into this edition. It is laid down that the entire responsibility for the efficient custody and maintenance of mobilisation stores rests with general officers commanding districts; while, under such general officers, commanding officers of units, etc., will be held directly responsible that mobilisation stores under their charge are kept in a serviceable condition, in proper working order, and complete in all details. A new chapter is also added to the book, dealing with the question of "mobilisation equipment." This provides for the proper custody of equipment (styled "station equipment") to be used on mobilisation by units at various stations. It will be kept entirely separate from the equipment of the peace establishment, and will not be taken into use without due authority, except for a period of about one week annually, when it will be drawn from store with a view to the units being practised in packing their vehicles, and so forth, the course terminating with a route march with regimental transport packed as it would be under field service conditions. This chapter on mobilisation is supplemented by detailed instructions relating to harness and saddlery stored for use, on mobilisation, with registered reserve horses. As regards inspection of equipment, it is laid down that general officers commanding districts shall cause an inspection to be made in January and July of each year of the "station equipment" in possession of units; and that a joint inspection of works, magazines, stores, workshops, and so forth is to be made annually by the officer commanding the Royal Artillery in the district, the district engineer, and the chief ordnance officer of the district. In connection with the regulations for the repair and preservation of equipment, it is laid down that the responsibility for the repair and custody of the reserve arms and accoutrements at the headquarters of regimental depôts lies with the officers commanding the regimental districts. The sergeants of the permanent staff of the Militia battalions are to be placed in charge of the arms, and are to make frequent periodical examinations of all arms, etc., with a view to their preservation in good condition. For purposes of the inspection and repair of arms, provision is made for the posting of circuit armourer-sergeants to various districts, and a revised list of their circuits is given. They will be supplied in advance, with components for the repair of the arms, and will report the results of their inspections to the chief ordnance officer of the district. Special directions are given as to the cleaning and preservation of brown accoutrements, and as to the avoidance of injurious cleaning materials. The list of materials allowed for the repair and preservation of arms has been largely amended. Besides the foregoing, the various amendments of the equipment regulations, which have been promulgated by Army Orders since September, 1895, have been embodied in the new edition, and numerous minor alterations and additions to the regulations have been made.

A statement in the House of Commons by the Financial Secretary to the War Office explains the intention of the authorities in regard to the officers of the Army Medical Service. The present compound titles will be exchanged for simple titles representing rank in the Army, and the Medical Service will be united into one corps, to be called the "Army Medical Corps." In future, therefore, medical officers will be called lieutenants, captains, majors, lieutenant-colonels, and colonels in the Army Medical Corps. Nothing has yet been decided in regard to any higher rank than that of colonel.

The report of the result of the examination held last November in subjects (c), (d), (e), (f), and (g) has been issued. One hundred and thirty-seven captains underwent examination, of which 33 failed, chiefly in military topography; 201 subalterns were examined, 144 of whom passed and 57 failed, principally in tactics. The report states that the captains' papers in military topography show an unsatisfactory result and little knowledge of practical topography. For instance, question 5 (how to "set" a map) was not answered by 11, and was inadequately answered by 81 out of 90. Question 7 (how to interpolate 10-foot contours on a 6-inch map) was not answered by 30, and was inadequately answered by 32 out of 90. To question 8 (the magnetic bearing of S.S.W. true) 52 out of 90 failed to reply. Question 10 (how to construct a scale of horses' paces) 40 failed to answer. A further feature in the examination is the fact that the "theoretical" questions were generally well answered, and the practical ones the reverse. In other respects the examinations were fairly satisfactory.

It has been decided to close the School of Range Finding at Aldershot, it being considered that the School, which has been 15 years in existence, has achieved its object in training officers and N.C. officers as range-finders without the inconvenience and expense which the maintenance of a separate establishment entails.

AUSTRALIA.—On the whole, we think the Government of New South Wales is making a good move in bringing out another Imperial officer to act as an infantry adjutant. All things being equal, appointments to the Staff should, of course, go to colonial officers; that is an article of our faith, and we shall never lose an opportunity of pressing their claims. But our readers do not need to be reminded that a desire on the part of the authorities to promote colonial officers has, during recent months, made itself very apparent. We need only instance the appointments of Lieut. Thompson to the 1st Australian Horse, of Lieut. Grieve to the Australian Rifles, and of Lieut. Holmes to the St. George's Rifles. So far so good. But a leaven of the Imperial article is indisputably a good thing, and colonial officers themselves will be the first to admit it. As far as military matters are concerned, these Colonies must be kept up to date, and we do not see how this can be secured save by an occasional importation of an Imperial officer. We say so in the best interests of colonial officers, and trust that none will consider themselves slighted or their good work unappreciated, because in this instance an Imperial stranger is to be brought in. The next half-dozen appointments, at least, will certainly go within our little army. We conclude this very short article with the statement that we see no reason why five-sixths of all the appointments worth having should not go to our own officers.—*Australasian U. S. Gazette.*

Major-General G. A. French, C.M.G., Commandant of the Colonial Forces, New South Wales, in his annual report, has commented strongly on the local Rifle Association:—"I think I may safely say that the matter of the encouragement of rifle shooting has been deliberately handed over by the Government to certain irresponsible bodies called 'Rifle Associations.' I admit that it is a great advantage to have all the work and worry necessary for carrying out rifle meetings done by committees for nothing but the mere love of the thing; but from close observation of the working of these associations, I am compelled to inquire—For what purpose does the Government hand over such large sums? And I assume that it is mainly for the purpose of encouraging and improving the shooting of the Defensive Forces of the Colony. Being an old rifle shot myself, I probably have interested myself more than might seem necessary in this matter; but I am not sorry for having done so, as I feel certain I can now show good cause for the present system being considerably modified. . . . . In no other

form of sport that I know of are such facilities provided by Government for its enjoyment. The 'pot-hunter' is not an ideal sportsman in any line; but in the line of rifle shooting in New South Wales he must have approached as nearly to the Pot-hunter's Paradise as is possible on this sinful earth. A paternal Government gives him a rifle to shoot with, free ammunition to use with it, a free railway pass to and from the shooting grounds, even if hundreds of miles from his own residence, and then very handsome cash prizes to reward his skill. Finally, if a master in his art, he may look forward to a trip to England on the simple condition that he takes the prizes, and some one else foots the bills. I understand that at the last association meeting at Randwick, some of the competitors took as much as £100 in prizes. There is no pretence at handicapping; the same crack shots are allowed to enter match after match on equal terms with beginners; the consequence of all this being that very few of the rank and file of the Defence Forces have much chance of obtaining good prizes. From all this I infer that if it is the desire of the Government to bring up the general average of the shooting of the Defence Forces rather than furnish fancy prizes for a favoured few, it will be necessary to modify considerably the conditions on which grants are now given to the rifle associations. I trust that nothing in the above may be construed into my being opposed to rifle associations. They have done excellent work, and I hope will continue to do it; but I do not think their present system the best means of bringing up the general average of shooting. At the same time, anything which goes to encourage rifle shooting in any shape or form is a distinct gain to defence." The council of the New South Wales R.A., through its secretary, at once addressed to the Minister a lengthy communication combating the strictures of General French. Then came the appointment of a committee of officers, who, after careful deliberation, upheld the General's view.

AUSTRIA-HUNGARY.—During the last three years there has been a very great addition to the military buildings of Budapest. Eight barracks have been built in that time, namely, the Count John Palffy and Archduke William Artillery Barracks, the Baron Loudon, Count Nadasdy, Archduke Charles and Archduke Albrecht Barracks, the Count Radetsky, and the Train Barracks. Besides the barracks, the following buildings have been constructed in the same period:—An Infantry Cadet School, a Military Store, an Auxiliary Military Store, a Covered Riding School, a Field Artillery Material Depôt, and a Garrison Transport House. The completion of the Ordnance Depôt is also noted.—*Militär-Wochenblatt.*

It is possible for officers and cadets to obtain leave from this year's manœuvres, but they cannot do so from the artillery practice, except on the most urgent grounds. The manœuvres will be held this year in South-Eastern Hungary and not in Bohemia. The 6th, 7th, and 12th Corps, namely those of Kaschan, Temesvar, and Hermannstadt, will be engaged. A number of reserve troops will take part. In addition to the above, 72 men per company will be called out from eleven corps, for periods of thirteen and nineteen days. In the artillery, reservists of five or seven or more years' service will attend. Officers and men of the pioneers are to assemble on the 2nd August. In the engineers, men enlisted in 1888-89-90 will come out for a period of twenty-eight days, and the remainder for thirteen days, the assemblies being on the 3rd May and 2nd August respectively. Ersatz reservists of the telegraph and railway regiments are to be out for twenty-eight days.—*Militär-Zeitung.*

FRANCE.—The following is a list of the troops to be called out in the present year. Of the reserve of the Standing Army, the men of the 1894 class who were allowed to go on leave after one year's service, and those of the same category

who wish to become officers in the reserve; all the men, of whatever branch, belonging to the classes of 1888 and 1891. Warning is given that the autumn manœuvres will begin on the 22nd August, and continue till the 18th September. Of the Territorial Army, the classes of 1882 and 1883 in the cavalry, engineers, and infantry; the class of 1882 in the train and the subsidiary services. The reservists of the Territorial Army and the Auxiliary Services, not included in the foregoing list, will merely be called out for muster. Special orders have been issued for Corsica, Algiers, and Tunis. In Corsica the details will be left to the general in command. The arrangements in Algiers and Tunis will be similar to those in France.

The railway from Nice to Draguignan, which has been strategically designed to defend the country through which it passes, against attack from the sea, has been completed. The laying of a second line on the railway from Caen to Cherbourg is being rapidly pressed on. The second line will soon be open for traffic over the whole distance.—*Militär-Wochenblatt.*

This year's army manœuvres, in which two armies will oppose each other, will be carried out, on the one side by General Caillard, commanding the 8th (Bourges) Corps, and on the other by General Jacquemin, commanding the 13th (Clermont-Ferrand) Corps. The whole will be under the command of General de Negrier, in his capacity of an inspector-general of the Army. The theatre of operations will be the country between Bourges, Clermont-Ferrand, Lyons, and Autun.—*La France Militaire.*

In autumn the 3rd Corps will drill and shoot under service conditions, at Châlons for eight days, and will afterwards manœuvre for eight days more against the 6th Corps. The supreme command will be held by General Jamont. The other corps will practise brigade and divisional operations. The 9th Division, stationed in Paris, will not manœuvre. So far as it is possible all regiments, except those in the Paris garrison and forts, must turn out with their fourth battalions. If any of the latter have not four complete companies an effort is to be made to fill them up with reservists. The cavalry brigades not taking part in the corps or divisional manœuvres, amounting to some fourteen brigades, will go out for eight days' brigade drill. The operations in the Alps and the Vosges will be specially organised. The territorial regiments called out in October are not to be moved from their stations to join in the manœuvres.

The Mont-Valerien School of Military Telegraphy, which has hitherto been employed solely in the training of telegraphic instructors for the engineers, will in future undertake the instruction of telegraphic pupils intended to supply the fortresses, the telegraphists of the engineers, the reserve, and the Territorial Army. It will also furnish instructors for the customs officials and foresters on the frontier, and be responsible for the instruction of barrack officials who have telegraphic duties in fortified places, as well as of mechanists in charge of engines for the production of electric light for visual purposes. It will, further, instruct soldiers of the Paris garrison who are detailed for the postal telegraph service of the barracks. The school is under the direction of a captain attached to the central depôt of military telegraphy, who has under him, as instructors, three lieutenants, five sergeants, and nine corporals. The school receives 150 pupils, who at the end of their course are proficient in visual and electric telegraphy, and are able to repair telegraphic and telephonic lines. There is, likewise, a school of military telegraphy in Algiers, which receives 48 telegraphic pupils.

The staff journeys and skeleton manœuvres will be conducted in 1898 in accordance with the regulations in force since 1895. The staff of each army corps and of the government of Paris will perform staff journeys. In the 14th and 15th regions the staff journeys will be performed under instructions to be issued here-

after. In all army corps except the 6th and 20th there will be two skeleton manœuvres of the active division and one of the reserve division. In the 6th and 20th Corps there will be three skeleton manœuvres of the active division and one of the reserve division. The Lyons brigade will execute skeleton brigade manœuvres. The seven cavalry divisions of the six permanent inspections will each execute a divisional skeleton manœuvre.

The following is the distribution of the Marine Artillery, from the 1st April:—3 mounted batteries, 1 mountain battery, and 2 foot batteries at Lorient; 2 mountain batteries and 3 foot batteries at Toulon; 2 foot batteries at Rochefort; 3 mounted batteries, 1 mountain battery, and 2 foot batteries at Cherbourg; 4 foot batteries at Brest.

A decree of the 11th February provides for the re-organisation of the Soudanese Rifle Regiment. This is a native corps which, after the transfer of its No. 3 Company to the Senegal Rifles, consisted of only 15 companies. It will now have 18 companies, No. 3 being reconstituted, and Nos. 17 and 18 created. There will be, in each of the four battalions, a bugler instead of the European buglers of companies, who have been abolished.

The commission appointed by the Chamber to examine proposals for the organisation of the colonial services, has reported as follows:—The proposals do not amount in effect to an organic law, but merely to temporary arrangements; there is no question of creating a new ministry; the deplorable conflicts between the naval and colonial ministries should be brought to an end; and it is necessary that the authorities should go to the root of the colonial corps question, by creating a colonial army, the necessity for which is acknowledged, both for the defence of our foreign possessions and for preserving the integrity of our home forces. The report further sets forth the following items as essential in the colonies and protectorates, with the exception of Tunis:—1. The administrative military services are to be entrusted to the colonial commissariat officers and agents and to the corps of Colonial Accountants. 2. The health service, with the exception of that which is simply regimental, is to be performed by the Colonial Health Corps and Hospital Corps. 3. The inspection of transportation and other penal establishments is the duty of the colonial military inspectors. The decrees and regulations affecting these corps, in a military sense, must be countersigned by the colonial minister and by the minister at home, who is responsible for the troops serving in the colonies.—*Revue du Cercle Militaire.*

An experiment has been ordered to take place in fifteen regiments for the purpose of proving the superiority of aluminium buttons over those of pewter now in use. About 4,000 aluminium buttons have been distributed among these fifteen regiments, and are to be worn for one year.—*Le Progrès Militaire.*

GERMANY.—The Imperial manœuvres of this year will be executed by the 7th Corps, reinforced by the 7th Infantry Division of the 4th Corps, and by the 10th Corps, reinforced by the 17th Infantry Division of the 9th Corps. The 7th and 17th Divisions are each composed of three brigades, and each of them likewise includes a regiment of cavalry, a regiment of field artillery, and two companies of pioneers. Cyclist and balloon detachments will be employed.

A modification of the cavalry organisation was to take place on the 1st April. Hitherto the cavalry has been divided into two "inspections," at the head of each being an inspector with the rank of commander of an army corps. The number of these inspectors has now been increased to four, and in addition an inspector-general has been appointed, who will include in his department the various special

cavalry establishments, such as the School of Equitation at Hanover, the Military Veterinary School, and others, which will henceforward not be directly under the Minister of War.—*Revue du Cercle Militaire.*

The advance of mechanical art during the last thirty years has made the field guns of the Franco-German war obsolete. Mechanical engineers and field artillerymen have both given their opinions on the subject, sometimes contradicting each other. Effect and mobility have both to be considered, but a small calibre is sufficient for all purposes. The field gun should carry farther than the infantry rifle, and its projectile must have greater initial velocity. This necessitates a larger charge, which again requires a heavier gun and carriage. The German field guns have hitherto been from 2,000 to 2,200 kilos, but the weight has now come down to from 1,500 to 1,800 kilos, and yet better results are obtained. As the calibre and the weight of the projectile are decreased, the initial velocity increases, and as the length of the projectile is increased, the resistance of the air is more easily overcome. With increased length the shrapnel contains more bullets, and the latter are said to receive a further impetus from the bursting charge, which is placed at the base of the projectile. The gas pressure in the new guns is from 2,000 to 3,000 atmospheres; the length of bore is from 2 to 2·7 metres. All armies are endeavouring to make a field gun that will fire a projectile of sufficient weight, and of the right length, with great initial velocity. Care must be taken to prevent the projectile from turning over in flight, by increasing the rapidity of the twist. Nearly everywhere, and certainly in Germany, simplicity and ease in serving the gun are aimed at, and several of the more difficult and slow parts of the drill have been changed for the better, this being made possible by the construction of the carriage, and the arrangements for laying and loading, which take place simultaneously. The tangent scale has been placed at an acute, instead of a right, angle, which has proved better in practice. In future, more ammunition will be carried with these weapons in all armies, but the weight will be kept down by the lightness of the cases in which it is packed. The new field gun is an accomplished fact in Germany; but in Austria, Russia, France, and Italy it is still on the way.

The second volume of the German Field Artillery Exercise, which has just been published, contains the following particulars regarding the Q.F. gun. The breech is closed by a wedge-piece which is very easily handled; the gun is fired by means of a lanyard and a lock, the latter being furnished with a guard or guide bolt. There is an excellent arrangement for laying. The carriage has the old brake for firing and driving, and can be trained right and left, so that a free lateral range can be had. The projectiles are shell and shrapnel, with time and percussion fuses. Case shot is abolished. The cartridge has a tin envelope and is not fixed to the projectile. The gun detachment consists of six men, including the layer.—*Militär-Zeitung.*

ITALY.—The Commissariat and Pay Departments have been re-organised. The former will henceforth consist of 12 colonels, 12 lieut.-colonels, 27 majors, and 117 captains—in all 168 officers. In the Pay Department there are one colonel, 12 lieut.-colonels, 48 majors, 335 captains, 769 lieutenants and sub-lieutenants—a total of 1,165 officers.

A new squadron has been added to the existing two riding-school squadrons. The strength of the latter is 352 men and 244 horses, that of the new squadron is 248 men and 273 horses. One squadron is stationed in Turin, two are at Pinerolo, and there is a detachment at Modena. Of the 24 Italian cavalry regiments, the first 10 are armed with lances.—*Militär-Wochenblatt.*

In the present year, the one-year volunteers have been allowed to join either on the 7th March or the 1st November, on which date they must have completed their 17th year. Each squadron, battery, or infantry company may receive six of them. Eight are employed in each of the 26 principal military hospitals. One of the conditions of their acceptance is that they must have gone through the national target practice, once at least, and those who postpone their one-year's service till their 26th year must, in addition, have hit the target five times, as a minimum.—*Revue du Cercle Militaire.*

RUSSIA.—In the report on the health of the Russian Standing Army, for the year 1895, the number of officers is stated as 40,356, and of under-officers and men as 981,256. Of the officers 50·8 per cent. were sick, and 0·64 per cent. died. Of the soldiers, each man was, on the average, more than twice sick in the year, and 2·4 per cent. were discharged medically unfit. If the deaths are added to the last figure, the result is a loss of 3 per cent. The Cossacks had the least, and the infantry the greatest, amount of sickness. The highest percentage was reported from Trans-Caspia, where it was 327·5, that in St. Petersburg having been 271 per cent.

A measure recently adopted in the Russian Army has been published in the *Russian Invalid*, and supplies England with food for reflection, about which there can hardly be any mistake. At Taschkent, in the military district of Turkestan, arrangements have been made for the instruction of officers in the languages of India. The course of study lasts for two years, at the end of which period students may be sent to India to prosecute their studies still further. All officers of the general staff and those about to enter it are eligible, as well as a certain proportion of other officers. Those who become proficient are to be rewarded with half-a-year's extra pay.—*Militär-Zeitung.*

The Gerard cycle appears to have been definitely adopted in the Russian Army, in consequence of the experiments which have been made in the grand manœuvres, especially those of the last two years. General Plutzinski, the military authority on cycling, has introduced certain modifications which he desired the inventor to make in the machine, in order to suit it to ground on which it will be generally used in Russia. This machine is denominated "the Russian Army pattern." Its advantages are:—The ease and quickness with which it can be folded and unfolded, the compactness of the folded machine, the convenience with which it can be carried on the back, and the facilities it affords the soldier to dismount, fire, and remount.

The projected railway which is to run from Proskourov to Chepetovka, in Volhynia, will be of great commercial importance, owing to its shortening the journey from Odessa to Warsaw and Königsberg. Its strategic value will be equally great, as it will allow the concentration of troops along the frontier, and will establish communication between the north and south branches of the Kieff-Lemberg line. A necessary strategic complement of this line will be one from Proskourov to Kemenetz to permit concentrations throughout the south-west.—*Revue du Cercle Militaire.*

SPAIN.—The war strength of Spain amounts to nearly 500,000 men. In Cuba there are fifty-six Line battalions and ten Rifle battalions, amounting in round numbers to 130,000 men. In addition there are available for mobilisation in the peninsula, including the garrisons of the Balearic and Canary Islands, and of North Africa, 122 battalions of infantry, amounting to 124,000 men; 28 regiments of cavalry, amounting to 19,600 men and 16,708 horses; 816 field guns and 25,600 men;

three mountain artillery regiments and ammunition columns, comprising 7,254 men; 8,175 fortress gunners, in nine battalions partly of six and partly of four companies, and 13,754 engineers, including a pontoon regiment, a railway regiment, and a telegraph battalion. There is also available a Reserve of 112,000 infantry, 9,828 cavalry, 14,140 field artillerymen, and 6,000 engineers. So that in round numbers Spain will have available on mobilisation 470,000 men, with 25,108 horses (cavalry), and 952 guns.

SWITZERLAND.—Permission to visit the fortifications of St. Gotthard and St. Maurice will in future be confined to the following persons:—Those who visit the works in performance of their official duty, members of the parliamentary and judicial bodies, members of the governments of cantons, and officers of the Swiss Army. Such persons will be furnished with tickets on application to the Federal Military Department.—*Militär-Zeitung.*

UNITED STATES.—Only second in importance to the bill to increase the artillery which this week becomes a law with only seven votes against it in the two Houses, is the bill to give our infantry regiments the three-battalion organisation. It is one of the necessary and essential measures, not only for war, but of preparation for war in time of peace. It adds very little to the present strength of the infantry, unless it should be found necessary to increase the number of infantry regiments, but, as we showed last week, it provides a feasible and flexible system for enlarging our fighting force without incurring the enormous expense and the unavoidable risks inseparable from the attempts to prepare for battle with hastily organised and untrained levies of men ignorant of the first duty of a soldier. We know what this has cost us in the past: why should we incur the expense again when there is no occasion for it? With a Regular Army of sufficient strength to form the fighting line, and with the organised Militia for local service, we should have a force quite sufficient for our needs against Spain. It will be only an embarrassment to form new organisations of volunteers faster than they can be armed and trained; sending them into the field under men with little or no military experience, and profoundly ignorant of what constitutes the soldier. Do we forget the experiences on our lake frontier and elsewhere in 1812? Do we forget the sack of Washington? Is the lesson of Bull Run lost to us, and the memory of the ten thousand men who crouched under the bluffs at Shiloh a panic-stricken crowd? Must we again purchase success at the cost of such experiences? It so, a fearful responsibility will rest upon those who subject us to them. We may not have war with Spain, but it is hard to see how we are to escape from the present situation without it. We certainly shall have it if we do not provide against it. This is not a matter within our choice. We cannot go on for ever threatening and bullying. The time is near at hand when we must act and accept the consequences, whatever they may be. There is little conception in this country of the actual condition of public opinion in the Iberian peninsula. As to the assertion that pecuniary considerations withhold the hand of Spain, we must remember that even bankrupt States, such as Turkey, have shown us that they can find money and men for war. We incur but one great risk, and that is the risk that we may commit the conduct of our affairs in time of war to the hands of ignorance and incapacity. There is a double risk in this; it will subject us to the possibility of humiliation, and it will encourage interference from other Powers, who, if they do not love Spain, may love us even less, and have their own reasons for seeing us discomfited. We have at the head of the Government a soldier trained on the battle-fields of our Civil War. We have at the head of the War Department another veteran of that war. They at least know what war means, and if the conduct of our preparations is left to them, we do not doubt that wisdom will guide. We have in Congress men who are ripe in military experience; such men as General

Hawley of Connecticut, and General Wheeler of Alabama, a famous cavalry leader of our Civil War. If their advice is heeded, we shall avoid some of the mistakes of the past. God save us from the guidance of men who know so little that they do not appreciate their own ignorance; who have the sublime assurance to assert, as some of them are apparently doing, that by resigning their seats in Congress and putting themselves in the lead of men as ignorant as themselves, they can become soldiers; without training in military habits of thought; without knowledge of military methods; without the smallest appreciation of the necessities of discipline, or the proper preparation of troops for the field and their direction and care while under arms. The lesser part of a soldier's time is occupied with fighting, and only an insignificant part of an officer's energies and abilites are occupied on the field of battle. If he does not know how to take care of his men in camp and garrison, how to protect them against the hardships of campaigning, how to inspire them with that confidence in themselves and in him, which can only come with training—and years of training—the battle is lost in advance. We by no means assert that military capacity is confined to our Regular Army; but military organisation is. Under the stress of war many of our trained soldiers may be found incompetent, physically or otherwise, and changes in command will be required; but these can be made easily without the demoralisation which will inevitably result from leaving the question of selecting not only the troops, but the men to command troops, to forty-five civilian Governors, without experience, and controlled by political considerations and political methods in their appointments.—*U. S. Army and Navy Journal.*

In view of a possible war between Spain and the United States, the following account of the latter's military resources may be interesting:—The President is the Commander-in-Chief of the Army and Militia when called into service. The Standing Army consists of 25,000 men and 2,116 officers; and of the latter 19 are generals, 71 colonels, 92 lieutenant-colonels, 207 majors, and 633 captains. There are ten regiments of cavalry, including the 9th and 10th Regiments, which are composed of negroes, but with white officers; their numbers amount to 432 officers and 6,170 men. The artillery comprises 280 officers and 4,025 men, but a slight increase has lately been made to this branch. The infantry consists of twenty-five regiments, including the 24th and 25th, composed of negroes; a total of 877 officers and 13,125 men. In addition to this Regular Army of 25,000 men, each State is supposed to have a Militia, in which all men between the ages of 18 and 44 capable of bearing arms ought to be enrolled; but in several States the organisation is imperfect. The organised Militia numbers about 9,000 officers and 106,000 rank and file. The number of citizens who, in the event of war, would be available for service in the Militia, is about ten millions.

NAVAL AND MILITARY CALENDAR.

MARCH, 1898.

1st (T.) Publication in *London Gazette* of Sir Wm. Lockhart's despatch on the Tirah Expedition; and of despatches from Colonel Reid and Lieut.-Colonel Montanaro on the operations of the Utman Khal Column of the Malakand Field Force.

,, ,, H.M.S. "Philomel" from the Cape, paid off at Devonport.

3rd (Th.) H.M.S. "Bonaventure" commissioned at Devonport for China.

4th (F.) British Brigade in the Soudan reached the Atbara.

5th (Sat.) Sirdar's Head Quarters established at Berber.

7th (M.) Baluchee Rebels, Persia, reported to have been dispersed.

9th (W.) Serious Plague Riots in Bombay.

10th (Th.) H.M.S. "Sirius" left Plymouth for Malta and East Indies with reliefs.

11th (F.) H.M.S. "Retribution" arrived at Plymouth from S.E. Coast of America.

12th (Sat.) Launch from the Vulcan Yard at Stettin of second-class cruiser "Hansa" for German Navy.

15th (T.) Egyptian Railway completed to Bashtinab, 73 miles south of Abu Hamed.

,, ,, Lieut.-Colonel Gaisford, Political Officer in Baluchistan, murdered by a native.

,, ,, H.M.S. "Sybille" arrived at Plymouth from the Mediterranean.

16th (W.) Publication in *London Gazette* of amendments to Major-General Sir Bindon Blood's despatch of 27th October, 1897, published in *London Gazette* of 11th January, 1898.

17th (Th.) Anglo-Egyptian Army concentrated at Kunar; the Dervishes at El Aliab.

18th (F.) Unsuccessful attack by Dervishes on Adamara, garrisoned by Egyptian friendlies.

,, ,, Dervish Army left El Aliab.

,, ,, New Brazilian second-class cruiser "Amazonas" transferred to United States at Gravesend.

19th (Sat.) H.M.S. "Bonaventure" left Plymouth for China.

21st (M.) Anglo-Egyptian Army arrived at Ras-El-Hudi.

22nd (T.) Launch from Ship-building Yard at Elswick, Newcastle-on-Tyne, of first-class armoured cruiser "Asama" for Japanese Navy.

23rd (W.) Annual Meeting of the Militia Rifle Association.

,, ,, Launch at Chatham of first-class battle-ship "Goliath."

24th (Th.) Bill introduced to amend the law relating to the Army Reserve and Militia.

,, ,, Annual Meeting of the National Artillery Association.

,, ,, H.M.S. "Terrible" commissioned at Portsmouth.

,, ,, Launch from Thornycroft's Yard at Chiswick of torpedo-boat destroyer "D 11" for German Government.

,, ,, Launch of first-class battle-ships "Kearsage" and "Kentucky" at Newport News for U.S. Navy.

26th (Sat.) Dervish position at Shendy captured by the Egyptian force.

,, ,, Russian Flag hoisted at Port Arthur and Talien-Wan.

29th (T.) H.M.S. "Retribution" paid off at Devonport.

30th (W.) H.M.S. "Rapid" arrived at Plymouth from Australia.

,, ,, Dervish Army discovered strongly entrenched at Nackheila.

31st (Th.) H.M.S. "Sybille" paid off at Devonport.

,, ,, Launch from Germania Yard at Kiel of third-class cruiser "Gazelle" for German Navy.

,, ,, 3rd Bns. of the Royal Warwickshire, Royal Fusiliers, and Lancashire Fusiliers formed.

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval.* Buenos-Aires.—Has not yet been received.

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. 4. Pola and Vienna: April, 1898.—Has not yet been received.

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: January, 1898.—"New Regulations for the Naval College." "Foreign Naval Notes."

February, 1898.—"The Penetration of Projectiles." "The Evolution of Navies during the last Ten Years." "Foreign Naval Notes."

FRANCE.—*Revue Maritime.* Paris: February, 1898.—"The Mechanic-Personnel of the Fleet." "Medical Report on the Cruise of the 'Eure' in New Guinea, 1897." "The Fourth Naval War between France and England (1335-1341)." "Bombardment of the Island of Lissa and the Battle of Lissa." "On the Development of the Paymaster's Department in the German Navy." "The Murman Coast." "Foreign Naval Notes." "The Maritime Fisheries."

La Marine Française. Paris: 15th March, 1898.—"French Interests in the Basin of the Niger." "An Anglo-French War." "The Account for Works in the Navy." "Rapid Twin-screw Mail-boats in the Channel." "A Ministerial Discourse."

Le Yacht. Paris: 5th March, 1898.—"Shells of large capacity and the Armour of Cruisers." "Yachting Notes." "The Defence of the Coasts." 12th March.—"The Defence of the Coasts" (*continued*). "The Automatic Closing of Holes made by Shells." 19th March.—"The French Cup." "Yachting Notes." "The English Naval Estimates." "The Blowing up of the 'Maine.'" "Capitaines de Frégate and Lieutenants de Vaisseau of Fourteen Years' Standing." 26th March.—"The Defence of the Coasts" (*continued*). "Yachting Notes." "The French Cup."

Le Moniteur de la Flotte. Paris: 5th March, 1898.—"*À propos* of some Mishaps." "The Navy in Parliament." "Commissariat and Inspection for the Colonies." "The Accident to the 'Champagne.'" "Colonial Notes." 12th March.—"Merited Rewards." "The Navy in Parliament." "The New Armoured Cruiser 'Desaix.'" "Colonial Notes." 19th March.—"The Increase of the English Navy." "The Rejuvenation of the Cadres of Officers." "The Command for a Capitaine de Frégate." "Duration of Sea Commands." "The English Naval Estimates." "Colonial Notes." 26th March.—"The German Naval Sextennate." "The Navy in Parliament." "The Mobilisation of the Squadron of the North." "The Défense Mobile of Corsica." "Fishery and Ostriculture."

GERMANY.—*Marine Rundschau.* Berlin: April, 1898.—"The Kaiser's Naval Table." "The Fleet in the Framework of the Civilised State." "Strong Lights upon the Mediterranean." "Electric Steering-gear." "Proof of Metals for Tensile Strength and Expansion" (*concluded*). "World Intercourse." "Marine Engines with High Piston Velocity." "Modern Kites and their Use for Practical Purposes." "On the Encouragement of Club Exercises."

ITALY.—*Rivista Marittima Italiana.* Rome: March, 1898.—"The History of the Italian Navy." "The Micro-organisms of the Sea and the Changes in Hull-Protecting Paints." "Mahan and Callwell" (*continued*). "The Army and Navy of England." "Fourth Contribution to Naval Kinematics" (*concluded*). Letters to the Director:—"The Vassallo System of Sails." "Naval Recruiting." "Naval Notes, Home and Foreign." "Notices of Books," etc. Plates:—The English Battle-ship "Cæsar," destroyer "Whiting," Siamese cruiser "Maha Chakkri."

PORTUGAL.—*Revista Portugueza, Colonial e Maritima.* Lisbon: March, 1898.—Has not yet been received.

SPAIN.—*Revista General de Marina.* Madrid: March, 1898.—"Injuries to Machinery at Sea and the Method of Remedying them." "Mechanical Torpedoes." "The U.S. Ram 'Katahdin.'" "Conclusion of the Vocabulary of Powders and Explosives." "A Chapter of Naval Strategy" (*continued*). "International Congress of Naval Engineers and Constructors." "New Formulas of Nautical Astronomy." "The Entrance and Military Instruction of Aspirants for the Marine Guards and Cadets." "The Entrance into the Navy." "Protection against Torpedoes." "Geographical, Medical, and Social Study of the Island of Balabac." "The Navies in 1897." "The Destruction of the 'Maine.'"

MILITARY.

AUSTRIA-HUNGARY.—*Militär-Zeitung.* Vienna: 2nd March, 1898.—"The Situation in East Asia." "The Further Education of Officers." "The New Field Guns." 10th March.—"Federalism and the Army." "The Re-organisation of the English Army." "The Drills for 1898." "The Present Maritime Situation and its Strategic Significance." "The Increase of Pay." "The Influence of Ballooning on the Wars of the Future." "Economy in Rations." "The Question of Two Years' Army Service." "The Controversy on the German Supreme Military Courts."

Mittheilungen über Gegenstände des Artillerie- und Genie-Wesens. Vienna: March, 1898.—"On the Employment of Steel for Pontoons." "On Utilising Photography with Balloons."

Organ der Militär-wissenschaftlichen Vereine. Vienna: March, 1898.—"The Use of War Material at Sea." "Orders and Misapprehensions of the same in War."

FRANCE.—*Revue du Cercle Militaire.* Paris: 5th March, 1898.—"Attack on the Transport and Supply of an Army Corps by Cavalry during a Battle" (*concluded*). "The Combat" (*continued*). 12th March.—"The Combat" (*concluded*). "The Superior School of War in the Spanish Army." 19th March.—"Entrance Examinations for the Superior School of War." 26th March.—"The March, the Halting Places, and the Fight, in the case of Small Units." "Two Months in Russia."

Le Spectateur Militaire. Paris: March, 1898.—"Great and Small Manœuvres." "Guerilla Warfare and the Commissariat Service" (*continued*). "The Order Book of an Infantry Regiment in 1781" (*continued*). "Captain La Tour d'Auvergne, First Grenadier of the Republic." "The Course of Musketry for Superior Officers of Infantry at Châlons."

Revue de Cavalerie. Paris: March, 1898.—"Cavalry Combined with Infantry." "The Cavalry at the Manœuvres in 1897." "From Bautzen to Pläswitz" (*continued*). "The Improvement of Half-bred Horses in the Army by means of Racing Contests." "General Kellermann" (*continued*).

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Revue du Genie Militaire. Paris: March, 1898.—"Notes on Subterranean Sheets of Water." "Vauban: Analysis and Extracts."

Revue Militaire de l'Étranger. Paris: March, 1898.—"The New Method of Instruction in the Italian Army." "Organisation of the Artillery in the German Army." "The Italian Grand Manœuvres of 1897."

GERMANY.—*Militär-Wochenblatt.* Berlin: 2nd March, 1898.—"Ballistics and Casualties in Troop-leading." 5th March.—"Bavarian Military Handbook." "The German Red Cross in the Turco-Greek War of 1897." 9th March.—"The Field Railway, Wernshausen-Brotterode, in 1896-97." "Tactical and Strategical Principles of the Present Day." "The Struggle for the Mastery in Germany." "The German Red Cross in the Turco-Greek War of 1897" (*concluded*). 12th March.—"The Improvement of the Soldier's Rations." "World's History in Outline." "A British 30-pounder B.L. Gun." 16th March.—"Cavalry Divisions in Advance of the Strategical Front." "The Strength of the English Army." 19th March.—"Cavalry Divisions in Advance of the Strategical Front" (*concluded*). "An English Criticism on the German and French Manœuvres." "Artillery in the Advanced Guard." 23rd March.—"Ascanians and Hohenzollerns." "Prince Frederick Charles of Prussia: Memorial on 20th March at Metz." "Prince Bismarck's Sixtieth Year's Military Jubilee." "The Royal Saxon War Records and the Army House in Dresden." "The Organisation of Cyclist Detachments." "The Health of the French Army in 1895." 26th March.—"Prince Bismarck's Sixtieth Year's Military Jubilee" (*concluded*). "The Organisation of Cyclist Detachments" (*concluded*). 30th March.—"Lieut.-General von Gerhardt" (temporarily retired). "On Skill in Judging Distance." "Once more, Spichern." "The Marching Powers of Cyclist Troops."

Jahrbücher für die deutsche Armee und Marine. Berlin: March, 1898.—"Extracts from the Notebook of Staff-Surgeon Kretschmar in the Campaigns in the Tyrol, 1809, and in Spain, 1810" (*concluded*). "The Memoirs of Baratieri." "The Question of Infantry Attack" (*concluded*). "Field Mortar Batteries." "Cavalry Covering the Crossing of a River."

Neue Militärische Blätter. Berlin: March, 1898.—"The Real Meaning of Independent Command in War" (*continued*). "The French Royal Army in 1789." "The English Naval Manœuvres in 1897." "A Glance at Russia's Western Frontier." "District Commander, Adjutant, and Officer." "Guns *versus* Plates."

Deutsche Heeres-Zeitung. Berlin: 2nd March, 1898.—"The Influence of Ballooning in the Wars of the Future" (*concluded*). "Paris and the National Defence." 5th March.—"Horse Artillery and Q.F. Guns." "Plastomenit." 9th March.—"The Defensive Power of the Balkan States." "Preserved Provisions in the Army." 12th March.—"Preserved Provisions in the Army" (*concluded*). "Dismounted Cavalry Combat." 16th March.—"Dismounted Cavalry Combat" (*concluded*). "More on Military Clubs." "Remarks on North American Fortifications." 19th March.—"Royal Saxon War Records." "An Appreciation of Frederick the Great as a Commander." 23rd March.—

"An Appreciation of Frederick the Great as a Commander" (*continued*). 26th March.—"The Fortress in the Warfare of To-day." "An Appreciation of Frederick the Great as a Commander" (*continued*). 30th March.—"The Debate of March 18th in the Reichstag." "The Chief Command of the Russian Army in War." "An Appreciation of Frederick the Great as a Commander" (*continued*).

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ITALY.—*Rivista di Artiglieria e Genio.* Rome: February, 1898.—"Questions Relating to the Defensive Organisation of the Alpine Barrier—Study of a Permanent Battery." "Field Redoubts and the Fortification of Villages." "On the Deguise System—Considerations on." "Campaigning Trigonometry." "Our Campaigning Artillery on the Alpine Frontier." "A New Type of De-railing Apparatus for the Interruption of Railway Communication in War." Miscellaneous:—"Division of Angles in Equal Parts." "Employment of Artillery in Naval Engagements." "Telegraph Service During the Cuban Campaign." "New Field Carriage, Russian Model, 1895." "Wheels for Ordinary Carriage Roads, etc." "Military Notes, Home and Foreign." "Notices of Books."

Rivista Militare Italiana. Rome: March, 1898.—"Some Considerations on the Servo-Bulgarian War of 1890" (*concluded*). "On the Scientific Foundation of Geographical-Military Study and its Application to Geographical Work." "The Disembarkation of an Operating Force on a Hostile Coast." "Political Military Notes." 16th March.—"Provident Society for Officers of the Navy and Army." "Some Italian Military Writers of the Fifteenth Century." "The Situation in Uganda." "Political-Military Notes."

SPAIN.—*Memorial de Ingenieros del Ejército.* Madrid: February, 1898.—"Outlines of Defence, Fortification, and Armament of Maritime Positions" (*continued*). "Practical Operations against the Insurgents of Cavite" (*continued*). "The Roqué Infernal Machine Employed by the Cuban Insurgents for the Destruction of Trains in motion." "Inclined Plane for the Works of Monte Faro."

March, 1898.—"Outlines of Defence, Fortification, and Armament of Maritime Positions" (*continued*). "Practical Operations against the Insurgents of Cavite" (*continued*). "Photo-Theodolite" (*concluded*). "Inclined Plane for the Works of Monte Faro" (*concluded*).

Revista Técnica de Infantería y Caballería. Madrid: 1st March, 1898.—"On the Feeding of the Infantry Soldier." "On the Cuban Horse." "A Page of Spanish-Argentine Glory." 15th March, 1898.—"The War of the Low Countries." "On the Feeding of the Infantry Soldier" (*continued*). "On the Cuban Problem: Whites and Negroes."

SWITZERLAND.—*Revue Militaire Suisse.* Lausanne: March, 1898.—"Operations around Vienna in 1809." "The Manœuvres of the 2nd Corps in 1897" (*continued*).

NOTICES OF BOOKS.

A Short History of the Royal Navy 1217-1688. By DAVID HANNAY. London: Methuen and Co., 1898.

In this volume Mr. Hannay brings his history of the Royal Navy up to that great dividing line in our national history—the Revolution of 1688. In a second volume he will give us the history of the great war, and assuredly those who have read this volume will look forward with interest for its successor. For Mr. Hannay has given us no dry technical treatise, but a book palpitating with life and interest. He has not written for the naval officer or the expert, but for the man in the street. He has followed Mahan, and if that inimitable naval historian could possibly be beaten he has almost gone one better, for he has put the genesis and growth of England's sea-power before the lay reader in a way that must inspire him with an interest in his subject. And the man who does this does a lot for the British Empire. Always he gets a grip of his story and the true principles that underlie all efforts to obtain solid and sure sea-power. Take for example his account of how Hubert de Burgh spoiled the attempts of Eustace the Monk to aid the Barons in their attempt to depose and supplant their infant king, Henry IV. "Hubert de Burgh saw that the one effectual way of preventing Eustace from doing harm on shore was to beat him at sea before he could land. The man who reasoned like this had grasped the true principles of the defence of England. . . . . The sagacity of Englishmen has taught them to rely on the Navy first, and that protection has never wholly failed us in 680 years.' The man who is sound in his principles like this is a good teacher to instruct the man in the street. One fault, however, into which Mr. Hannay falls is to be regretted. He is too stern a critic and too apt to judge men of another age by nineteenth-century standards. This is scarcely fair, and it would be preferable if he made some little allowance for sentiment, and not depreciate men whose names are household words to, and whose personalities are dearly loved by, their countrymen.

Lines from my Log-Books. By Admiral the Right Honourable Sir JOHN C. DALRYMPLE HAY, Bart., K.C.B., D.C.L., F.R.S. Edinburgh: David Douglas, 1898.

Sir John Hay's autobiography is an interesting sailor's story, told in sailor fashion. It covers, moreover an extremely interesting period, for it takes us through the days that witnessed the development of that sailing Navy that won us our command of the sea, into that marvellous machine by which we intend to retain it. Admiral Hay joined the Navy as far back as 1839, and quitted it as lately as 1870. Much of his service was spent in Eastern waters, and his story of the suppression of Chinese piracy is well told, and interesting to a degree. He also saw service in the Crimea, and was for many years at the Admiralty. Much and good work he has also done for the Service and the country in the House of Commons. He tells his story in an interesting way, and there is much to be learnt from it.

Elephant Hunting in East Equatorial Africa. By ARTHUR H. NEUMANN. 8vo. London, 1898.

Three Years in Savage Africa. By LIONEL DECLE. 8vo. London, 1898.

Korea and her Neighbours. By Mrs. BISHOP (ISABELLA L. BIRD). 2 vols. 8vo. London, 1898.

Bibliographie Générale de la Guerre de 1870-71. Par le Commandant PALAT. 8vo. Paris, 1896.

La Mission Hourst. Par le Lieutenant de Vaisseau HOURST. 8vo. Paris, 1898.

Geschichte des Infanterie-Regiments General-Feldmarschall Prinz Friedrich Karl von Preussen Nr. 64. Von GENTZ UND VICROW. 8vo. Berlin, 1897.

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